THE OIL WEEKLY

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PUBLISHED BY
THE GULF PUBLISHING COMPANY
HOUSTON, TEXAS
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Staff correspondents at all important points.

Member Audit Bureau of Circulation
Member Associated Business Papers, Inc.

BRANCH OFFICES
NEW YORK.....250 Park Ave.
PITTSBURGH.....Vandergrift Bldg.
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SPECIALIZED OIL JOURNALS
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The Oil Man's Calendar

OCT.	
5- 7	**American Institute of Mining & Metallurgical Engineers, Petroleum Division, Galveston, Texas.**
5- 7	**Texas Mid-Continent Oil & Gas Association, Houston, Texas.**
9-10	**American Gas Association, Annual Convention, New York.**
16-20	**National Safety Congress, Atlantic City, N. J.**
17	**National Stripper Well Association, Fort Worth, Texas.**
18-20	**Independent Petroleum Association of America, Fort Worth, Texas.**
19-20	**A. I. M. E. Petroleum Division, Los Angeles.**
NOV.	
13-17	**American Petroleum Institute, Stevens Hotel, Chicago.**
14	**25-Year Club, Stevens Hotel, Chicago.**
15-17	**American Institute of Chemical Engineers, Providence, R. I.**
DEC.	
4- 7	**American Society of Mechanical Engineers, Philadelphia.**
APR.	
10-12	**American Association of Petroleum Geologists, Chicago.**
11-12	**American Petroleum Institute, Eastern District, Division of Production, Columbus, Ohio.**

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Published every Monday. Single Copies 15 cents (Special Issues 50c). Subscription price: domestic and foreign, $2.00 a year; 2 years $3.00. Entered as second-class mail matter December 23, 1916, at the post office at Houston, Texas, under act of March 3, 1879. Subscription restricted to those engaged in the producing and pipe line branches of the oil industry or the manufacturing and distribution of oil field supplies. Advertising rates on application.

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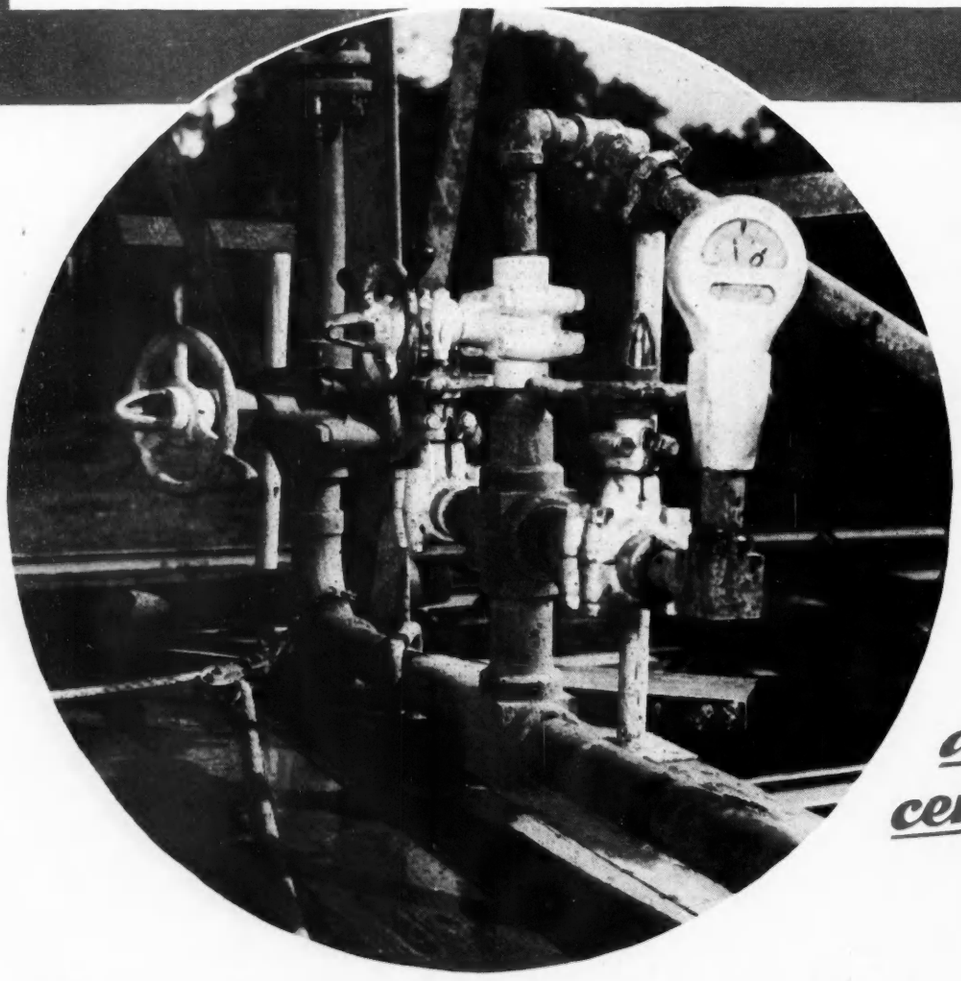
CAMERON FLEX-SEAL MUD VALVES

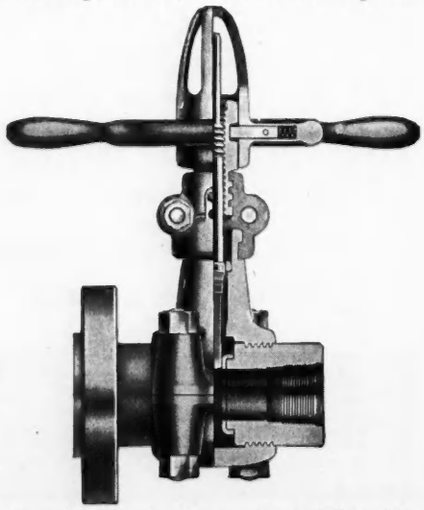


DRILLING THEIR FOURTH 10,500' WELL AT OLD OCEAN.....

and not one cent for Repairs!

These four Cameron Flex-Seal Mud Valves on a standpipe manifold at Old Ocean, Brazoria County, Texas, will soon complete their fourth 10,500' hole. They have required absolutely no maintenance, and a close inspection of the indicating stems reveals that so far there has been no appreciable amount of wear on the resilient flow-way inserts.

The low-cost trouble-free mud line service provided by Cameron Flex-Seal Mud Valves is attributed largely to the unique resilient flow-way insert, which absorbs the cutting action of abrasive-laden fluid at an extremely slow rate of wear. Unlike conventional gate valves, there is no metal-to-metal seal. The resilient insert provides a pressure-tight seat for the heat-treated alloy steel gate, even though the gate be sand-cut or damaged. Cuttings, or other foreign matter, are readily embedded in the resilient insert upon closing the gate. And when, after long service, the resilient insert wears out, it may be replaced in the field by the drilling crew, using ordinary rig tools. (Flow-way inserts and stem packers cost: $6.15 for 2" size; $10.75 for 4" size). The Cameron Flex-Seal Mud Valve opens and closes easily under 6000 lbs. pressure.



Cross-section view of a Cameron Flex-Seal Mud Valve, showing the gate in full open position. Note that the hubs are connected to the body by a series of shoulders and grooves, which permits the valve to swivel freely and serve as a union while assembling or dismantling in mud manifolds. The valve is of the indicating stem type, clearly showing the position of the gate at all times. All parts are freely interchangeable.

Descriptive literature will gladly be sent on request, or operators who are experiencing difficulty with conventional types of mud valves are invited to try a Cameron Flex-Seal.

CAMERON IRON WORKS, INC.
711 MILBY ST. HOUSTON, TEXAS
Export: 74 Trinity Place, New York, N. Y.
California Distributor:
The Howard Supply Co., Los Angeles

THE OIL WEEKLY

OCTOBER 2, 1939

VOLUME 95 NUMBER 4

The Week's Panorama

Clouds Arise . . . . . .

Not altogether reassuring is the current outlook for the oil industry, as a favorable demand situation is accompanied by a somewhat loose supply situation.

Export business expected to result from the European war is slow to develop, and so far, the remarkably good domestic demand remains the principal support under the current markets.

Yet supply is not being determined now wholly on the basis of normal requirements, apparently, but with some consideration of war business, which may or may not arise.

Crude Control . . . . . .

Crude oil production has been increased sharply since termination of the Mid-Continent shutdowns, and is not far under the all-time peak. And crude runs to stills in the week ended September 23 were only 5000 barrels a day less than the all-time record.

Furthermore, comparatively large crude output is in store for October, as the leading producing states contemplate liberalizing allowables for the month.

The Mid-Continent states have signified intention of staying within Bureau of Mines estimates of demand. But it is doubtful if the national production for October will be within the national market requirements, as Illinois and California consistently have been materially above their allocations.

Gasoline Stocks . . . . . .

Meanwhile, gasoline inventories remain exceptionally large for this time of year, and apparently, only the war influence is keeping the markets stable at the present, improved price levels.

Withdrawals from gasoline storage have continued sub-normal, and the stocks are 3.5 percent larger than at this time last year. That gain over a year ago may appear justified by the fact gasoline demand has been about 5 percent better this year than last year. But it should be remembered that last year's inventories proved seriously excessive and that gasoline prices sank last winter near all-time lows.

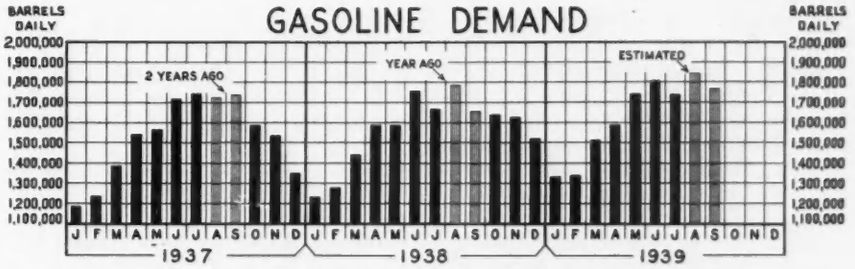
The markets are not overlooking the gasoline inventory situation, moreover, despite the lifting influence of the war. Gasoline prices have shared to some extent in the advances of prices in recent weeks. But the gains have not been as impressive as those for lubricants or as significant as those for fuel oils, inventories of which are more conservative.

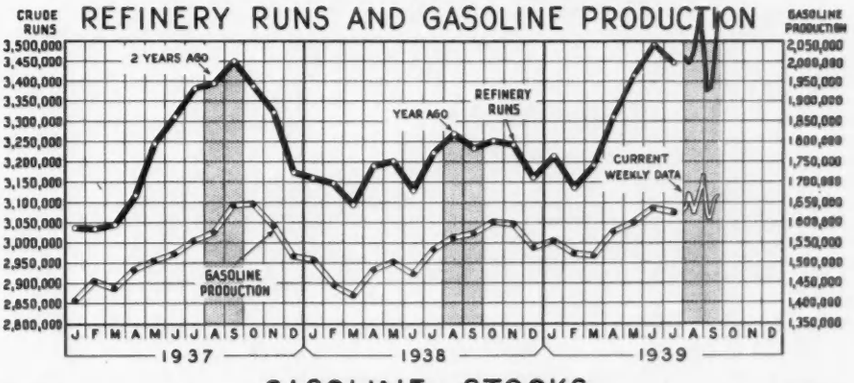
Danger Ahead . . . . . .

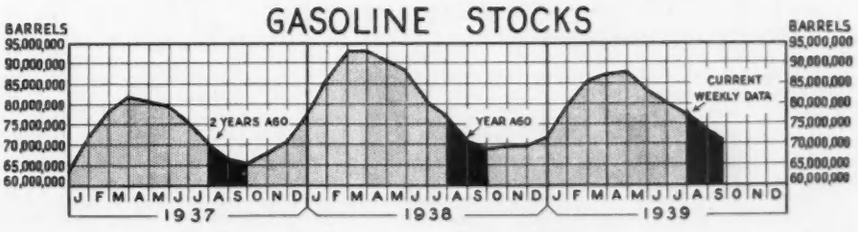
Before the end of the fall-winter period, substantially increased ex-

Gasoline Production Larger but Stocks Reduced

Plant output greater in week ended September 23, as refinery runs approach all-time peak. But gasoline demand is good, and storage is lowered.

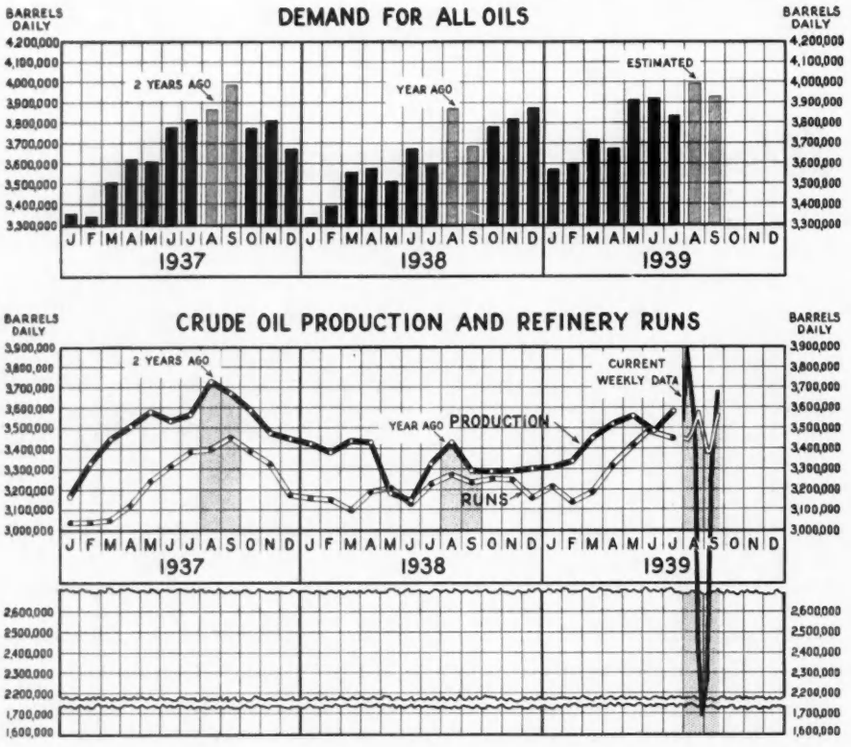






Crude Output and Refinery Runs Near Record Levels

Daily production within 228,000 barrels of all-time peak in week ended September 23, and runs to stills only 5000 barrels under record.


DEMAND FOR ALL OILS
BARRELS DAILY
2 YEARS AGO
YEAR AGO
ESTIMATED
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1937
1938
1939
CRUDE OIL PRODUCTION AND REFINERY RUNS
2 YEARS AGO
CURRENT WEEKLY DATA
YEAR AGO PRODUCTION
RUNS

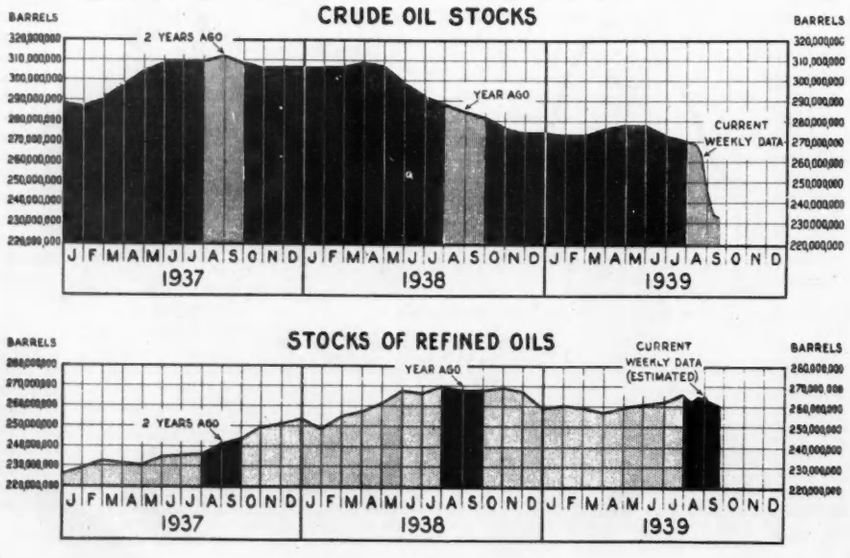
ports may be needed to assure a stable gasoline market and satisfactory prices.

For the industry will be called upon to fulfill an unprecedented demand for heating oils, and in meeting those requirements, it very likely will have difficulty in avoiding an uneconomic build-up of gasoline stocks.

A warning that still appears important is that the industry should strive to avoid excessive additions to gasoline stocks this fall and winter by holding down gasoline yield from crude and by obtaining relatively large heating oil yield.

Crude Oil Stocks Are Further Reduced

Large runs to stills result in further decrease of 810,000 barrels in crude oil storage in United States in week ended September 16.


CRUDE OIL STOCKS
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1937
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1939
STOCKS OF REFINED OILS
YEAR AGO
CURRENT WEEKLY DATA (ESTIMATED)
2 YEARS AGO

Crude Prices . . . . . .

Hope persists in some quarters that crude prices soon will be advanced generally. Some of the prophets are even naming the amount of the expected increase—25 cents a barrel.

These hopes are based on expected larger exports as well as improved product prices.

However, some of the skeptics point out that even the present postings are on probation. Some of the purchasers in restoring prices after the Mid-Continent shutdowns warned that the postings could be maintained only in the absence of under-market selling of crude.

At the middle of August prices around 20 cents a barrel under present postings were adopted temporarily, precipitating the 6-state shutdowns, which in turn led to the restoration of old prices.

Consequently, present prices allow for materially better conditions than those of mid-August.

These circumstances indicate that purchasers are not likely to advance postings generally without considerable deliberation and watching of the markets for evidence of sustained firmness. The large buyers would be particularly cautious at this juncture, moreover, as the fall-winter season normally is one of relatively weak markets.

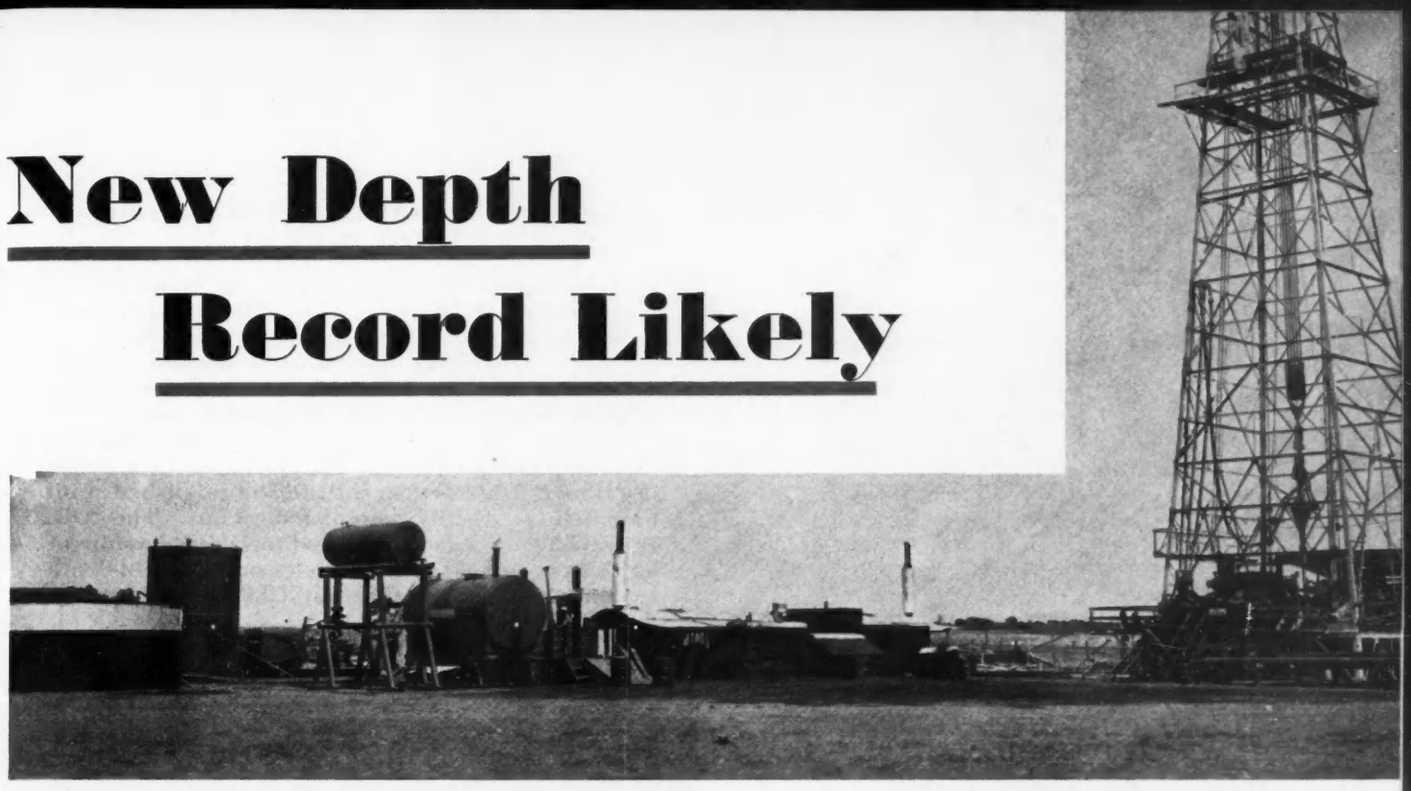
Pennsylvania grade crude probably will be advanced in price before any general increase occurs. That oil has come into materially increased demand lately, because of sharply higher requirements for lubricating oils, principal product obtained from the Pennsylvania crude. Pipe line companies have lifted proration of purchases in the Appalachian region, and for the immediate future, a seller's market is indicated.

Material Costs . . . . . .

Oil company managements are confronted with the prospect of higher material and equipment costs in the future, despite the fact that prices are being held down so far on steel and some other items.

In its operations, the oil industry is a large user of the heavy goods, including steel products, lumber, cement, and so forth; and inasmuch as the war will require those goods particularly, the oil companies probably will have to pay higher prices for their requirements.

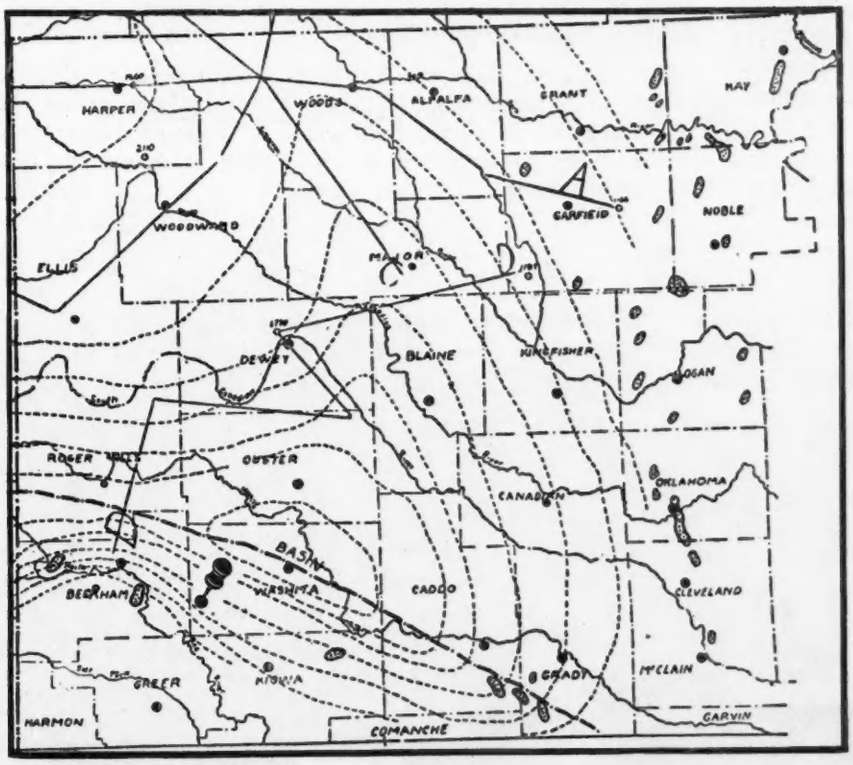
New Depth Record Likely



ALL existing deep well records of the world soon may be broken again. A test in Oklahoma now drilling below 14,500 feet—just 500 feet short of the current 15,004-foot record for the "deepest hole ever drilled"—is expected to continue digging beyond that level. It may even reach the three-mile mark, an undreamed of depth less than 10 years ago, but predicted by the industry's engineers in THE OIL WEEKLY's Deep Drilling Issue of July 31, 1939.

Already this well, Continental Oil Company's Proctor 1, has established a new Oklahoma depth record, is the second deepest test ever drilled, and is the third operation to ever exceed 14,000 feet.

Temporarily stalled for a month at 14,479 feet with stuck drill pipe, the well has successfully overcome the world's deepest fishing job. All but 28 feet of 2250 feet of drill pipe left in the hole after backing off were recovered, before sidetracking and resuming additional penetration.



The well is being drilled with modern heavy-duty Diesel-electric powered rotary rig. A 136-foot steel derrick rises above a massive steel substructure. Every precaution has been taken against shutdowns due to mechanical failures, including installation of two drawworks, standby power units and auxiliary slush pumps. The auxiliary drawworks and slush pumps are arranged for direct Diesel operation in case something should happen to the electrical equipment. The power plant, in center, consists of two large generating units and one auxiliary unit. Tanks are for storing Diesel fuel.

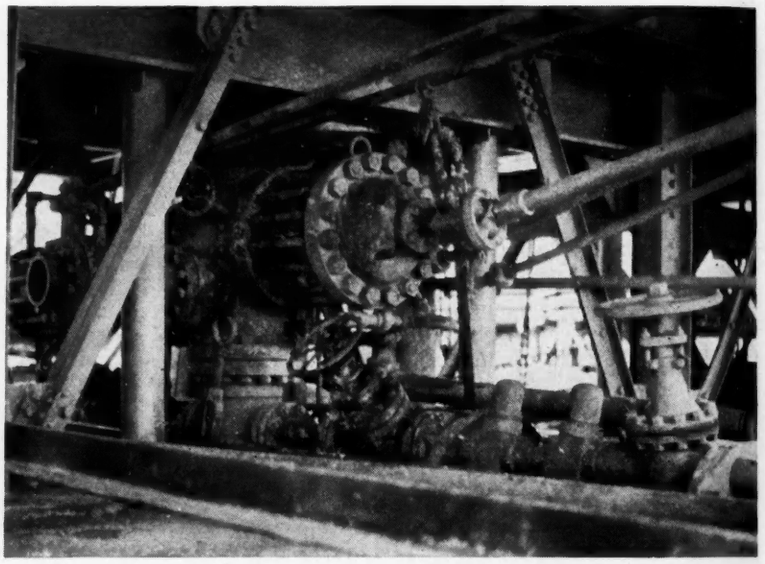
The Proctor test, located in Section 28-10n-20w, Washita County, Western Oklahoma, (see pin point on map) is a rank wildcat operation approximately 20 miles from the nearest production at Sayre in Beckham County. It is about 60 miles due west of the famed Binger test, which yielded the first production (although uncommercial) in the world from below 10,000 feet.

Geologically, Western Oklahoma is a great basin. Most prominent structural features are the Wichita Mountain high, immediately south and west from the well, and the Anadarko Basin low, on the rim of which the test is situated.

Here is nearly 14,000 feet of a combination 3½-inch and 4½-inch drill pipe string stacked in the derrick. Pulling is done with the heavy Diesel-electric powered drawworks shown on the right. An auxiliary drawworks, at left, is connected to a 150-horsepower Diesel engine for direct operation, in case of emergency.

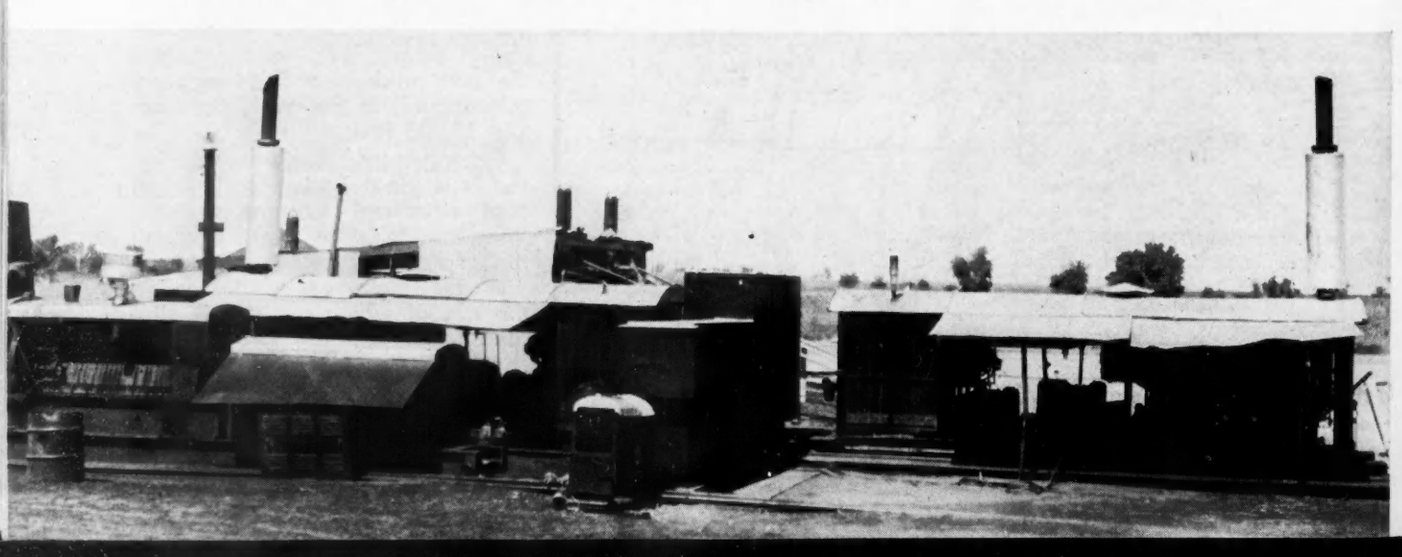
For Full Completion Details Watch The OIL WEEKLY

Deep drilling developments are of great importance to the oil industry. This will be particularly true of Continental Oil Company's Proctor 1 if it succeeds in reaching the "world's deepest depth." Already, The OIL WEEKLY has had one of its editors on the site, and is planning a comprehensive article on this interesting operation. So that the complete details may be presented in a single installment, this article will not be published until the well is finally completed. Thus, The OIL WEEKLY will continue its editorial leadership of having presented feature articles on all world-depth breaking wells since the first 10,000-foot test was drilled back in May, 1931.

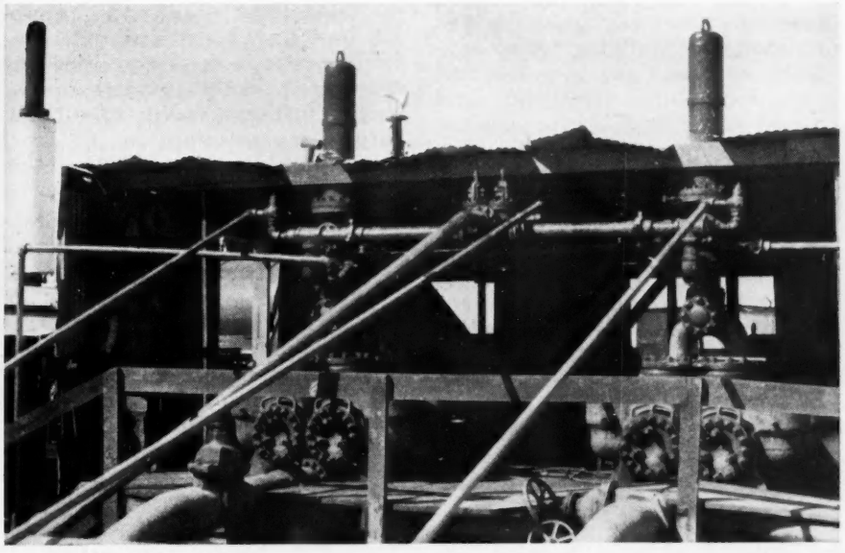


Considerable gas has ben encountered in drilling Proctor 1, but ample control provisions have prevented the creation of any difficulties. Both blowout preventer and drilling head are in use, as well as heavy mud line flow valves.

The three Diesel-electric units comprising the power plant are shown below. The two primary 350-horsepower 6-cylinder Diesel engine driven units are identified by the heavy exhausts, while the smaller auxiliary (160-horsepower) unit is in the left foreground.



This was one of the most important stages so far encountered in the drilling of Proctor 1. The day crew is shown pulling the full drill pipe string preparatory to drilling out cement and sidetracking above the 28-foot fish cemented in the hole near 14,479 feet. Successful performance of the sidetracking operation has permitted the well to be carried beyond the level at which it was stalled temporarily for a month, and has made possible its likelihood of establishing a new world's deep drilling record.



Special emphasis is being placed on mud control, and it is conditioned carefully. The vibrating screen, sumps and mixing guns are shown in the photograph below; while the slush pumps, a close-up of which is shown at left, are located in the right hand background of the lower picture. Two 7¾ x 20 power pumps are driven by electric motors, one by a 300-horsepower prime mover, and the other by a 225-horsepower motor. In addition the circulating plant includes a 150-horsepower direct driven standby pump.

Gains in Oil Industry Jobs for 15 Years Forecast

By L. J. LOGAN, Associate Editor

DESPITE technological improvements which have trebled the output per worker in the past 20 years, the petroleum and natural gas industry will continue for 10 or 15 years to provide increasing employment opportunities.

This is the general conclusion drawn in the lately published report of the WPA National Research Project on economic and technical trends in the oil and gas industry.

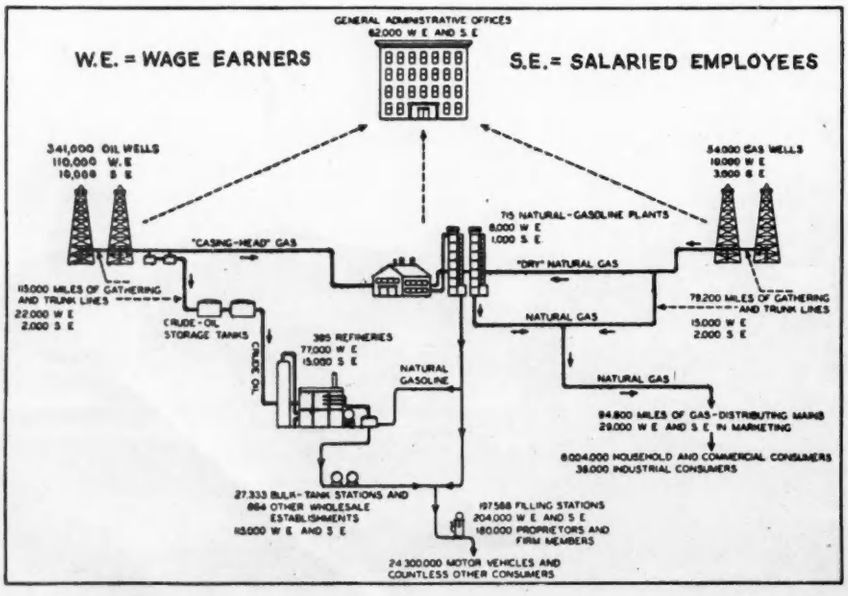
The report is comprehensive and interesting, embodying 350 pages with numerous charts, photographs, and tables. It is authoritative and well-rounded, as evidenced by the 2½ pages of acknowledgments made to numerous individuals and agencies that assisted in the compilation of material.

The book is entitled, "Technology, Employment, and Output per Man in Petroleum and Natural Gas Production," and it is identified as "A National Research Project on Reemployment Opportunities and Recent Changes in Industrial Techniques."

All indications point to steadily increasing fuel demands for many years, according to the report. Moreover, invention and improved production techniques serve constantly to reveal new uses for, and by-products of, petroleum and natural gas. These create new industrial demands, which in turn create new demands for labor. This expanding technology is not expected to abate or even to become static within the next 10 to 15 years at the least.

"Contrary to the outlook for most of the other extractive industries," read a letter of transmittal at the beginning of the report, "it is expected that over-all employment opportunities in oil and gas production probably will increase for at least the next decade and a half, although the manpower requirements of the different divisions of the industry will vary."

Employment in the oil and gas industry in the United States, by major divisions, 1935.



Employment in Production

The upward trend of employment at oil and gas wells—characteristic of developments until 1929—has been resumed, according to the report, and probably will continue for the next 10 or 15 years.

Drilling operations were described as requiring a large part of the labor force in oil and gas production, and continued extensive employment in these activities was considered likely because of expected further growth of oil and natural gas consumption.

More Refinery Work

A forecast of increased employment at natural gasoline extraction plants was based on growing demand for the lighter constituents of raw natural gasoline and on wider use of polymerization.

Employment in refining reached an all-time high in 1937, the report stated, and labor requirements at the refineries probably will continue to increase for possibly the next 15 years.

Pipe Lines Completed

No extensive changes were foreseen in the employment needs of the transportation and storage segments of the industry in the next decade. The pipe line and storage systems already are mechanized and efficient, and further labor saving possibilities are very limited, indicating maintenance of employment around present levels. But no extensive construction programs appear likely, to provide additional employment possibilities, the need for storage facilities having diminished rather than increased, because of more effective proration of oil production; while the pipe line networks have been fairly well completed.

Relatively low tanker rates have stimulated tanker movement to the East Coast and discouraged through-pipe-line movements from the Mid-Continent. Moreover,

shifting of production southward in recent years has reduced the average length of pipe line movement of oil destined for Gulf Coast and East Coast refineries. Consequently, only a moderate extension of crude oil lines was predicted for the next decade. Similarly, only a gradual extension of gas lines in the East was forecast, although extension of lines from California to Oregon and Washington was mentioned as possible. Continued gasoline pipe line construction on a moderate basis also was predicted.

Work Hours Better

An important factor in maintaining and expanding employment in the petroleum industry, the WPA book pointed out, has been a long-time trend toward shorter work weeks and work days.

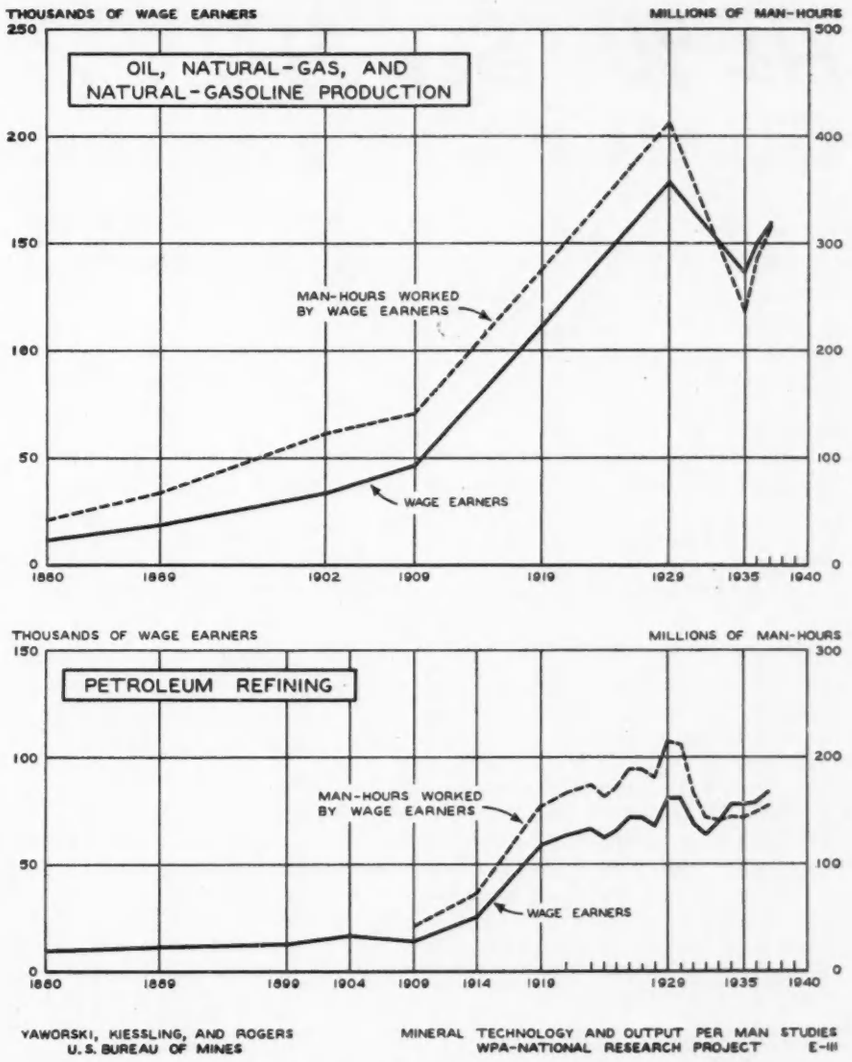
After the World War, the refineries generally established an 8-hour day and a work week of 48 to 56 hours. Under the NRA the work week was reduced to 40 hours. That schedule was generally followed for refinery workers and for operating employes of major pipe line companies when the Fair Labor Standards Act of 1938 became effective, and consequently, no large increases in employment resulted.

In drilling operations, however, the law caused an increase in employment, because of the maximum hour provisions. Previously, employes of some producing companies and drilling contractors worked 56 hours a week. But to conform with the 44-hour maximum prescribed for the first year of the law's operation, the companies hired additional men. Further increases in the number of workers are anticipated in the second year of the law, when the work week will be shortened to 42 hours, and again after 2 years, when the work week will be limited to 40 hours.

Employment Gains Steadily

Consistently upward was the trend of employment in the oil and gas industry through the boom year 1929, the report found; and meanwhile, total labor requirements grew rapidly, particularly during the war decade.

Since the decline in the early 30's and the sinking to the depression low of 1935, substantial recovery in employment has been made. For example, in the production division of the industry, excluding refining, total employment grew from 136,735 in 1935 to 159,800 in 1937.



Long-time trends of employment in petroleum and natural gas industry.

In the increased output per worker in the industry, striking improvements have been made, according to the report.

"The history of the petroleum and natural gas industry represents an almost continuous record of successive economies in unit labor requirements," it was stated. "Output per man-hour in oil and gas wells and natural gasoline plants increased more than 850 percent between 1880 and 1935. A more than three-fold gain was recorded in the relatively short span from 1919 to 1935.

Bright Future Foreseen

A continued vigorous existence for the oil and gas industry is regarded as assured by the known supplies of petroleum and the technological improvements which make a greater proportion of the supply recoverable. Additional assurance is given by the prospect of an increasing demand for gasoline and natural gas as fuels and for the numerous by-products developed in the research laboratories.

Both the short- and the long-term prospects indicate that additional workers will be required in the petroleum and natural gas industry, the report concluded; the outlook appearing fairly clear for at least 15 years.

The increase in employment is expected to follow in part the anticipated continued growth of demand for motor fuel and lubricants, and it will be influenced also by other factors, such as the shortening of the standard work-week, which will tend to counter-balance a continued increase in output per man-hour resulting from improved technology.

As We See It . . .

YES, WE ARE BIG

OPENING last week of another monopoly investigation of the oil industry reveals only the actors changed. Theme music is the familiar refrain "It is only ignoble to be big." One difference, however, is the amount of interest on the part of the public. What with wars, the world series and football coming up in the big tent, few pause for the side show exhibition of the blood-sweating behemoth or the wild man from Borneo. But the show goes on.

Summation of the case sought to be proved indicates that the technical adviser to the committee coached himself on the propaganda crystallized in a book published last year—even to the twenty companies whose individual and aggregate size are alleged as a menace to the public welfare and a danger to the democracy.

MONOPOLY is a word so strictly defined and its meaning so long in disrepute that it is really difficult to comprehend how it can be applied so loosely. Reason would hold it preposterous that as many as twenty units in this or any other industry could constitute a monopoly, when evidence of competition is so visible at street intersections throughout the country. Add to this the fact that the management of the competing companies, probably more universally than is the case in any other industry, are what have been termed rugged individualists, and it is further hard to understand how the charge of monopoly can be advanced.

BESIDES the rivalry among themselves, the big integrated companies have competition from hundreds of smaller units operating in one or more branches. As competitive force they are as potent as a leak in a dyke. The majority of these are well managed and relatively their profits are as large or larger than those of the big companies, although the figures on their balance sheets may not suggest the national debt. The larger resources of the big companies do not constitute monopoly of opportunity as the success of the smaller growing units continually proves. There are some, of course, who are not doing so well, but neither do the big units prosper when their management is unskilled or the hazards of the business are against them.

MONOPOLY first came into disrepute and under interdict because the privileged exclusive seller raised prices inordinately. If monopoly has entered into the oil industry, it certainly is of a most peculiar type. Perhaps its hoard of grief is a monopoly, and it has restricted to itself the privilege of supplying to the public a maximum of service at a minimum of price, meanwhile contributing to the general welfare, to good citizenship and stability of society by maintaining a wage scale far above the average.

THE patent question injects itself into the inquiry naturally, as it has been a partner in the monopoly controversy since exclusive grants by the crown first aroused protest in England. But the common law early established that reward for inventive skill is not opprobrious. Benefit to society in granting patents has been proven as regards the oil industry through multiplication of available supply of fuels, increase in quality and lowering of price. If there is criticism of the pooling of patents, the pooling is more than justified in that the advanced processes become available more readily to those who would make use of them, and at less cost. This is one case where the savings of economical practice have been made universally available.

Often it is this inabilitv of all units to share in economies of operation that blinds governmental bodies to the distinction between the welfare of the general public and of groups within an industry who are jealous of the profits of competitors who are more favored. We have this in the pleas for disintegration in the oil industry. Those who favor this course do not contend that the conditions of which they complain bar them from making profits, but that if the more efficient competition was removed, they could make more profits. Obviously, this would involve increased cost to the consumer. So far no legislation has been offered to compel farmers with big fields to plow short furrows because those who have small farms must turn often.

The oil industry must plead guilty to being big. Its very nature insists that its units grow big—and most of them started small. But as regards monopoly —defined as having no competition—its units compete to the point almost of ruination. And if it was all one man's it still would compete with coal, with water power, mules and sails, railroads and bicycles.

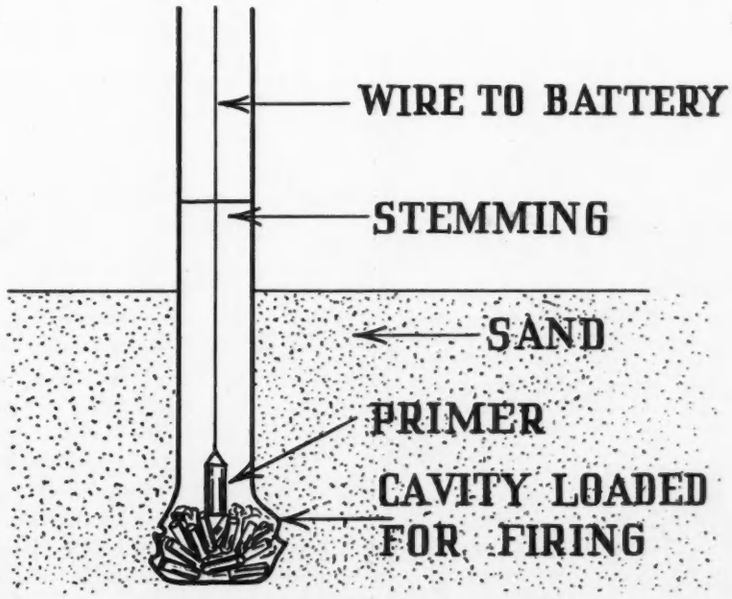
—J. K. R.

Selective Directional Shooting Pays a Profit

By F. R. COZZENS,
Equity Oil & Gas Company

Stripper area operators realizing several benefits from more effective drainage channels created when shots are directed upward and outward into oil sand.

WHEN an operator gives his newly drilled well a "shot" his purpose is to blast out a chamber in the sand-face and open up channels through which fluid can flow into it. He knows that the area of sand which can be drained into the reservoir thus created depends upon the length and type of channel, and if the location be in territory where fluid has no driving force behind it he must consider also the fact that the most effective drainage channels are those which reach upward and outward into the body of the sand. The making of such channels, known as angle drainage is becoming of major importance in re-drilling eastern stripper fields, and some very noteworthy results are being obtained by a system of selective directional shooting.



Method of loading selective shooting

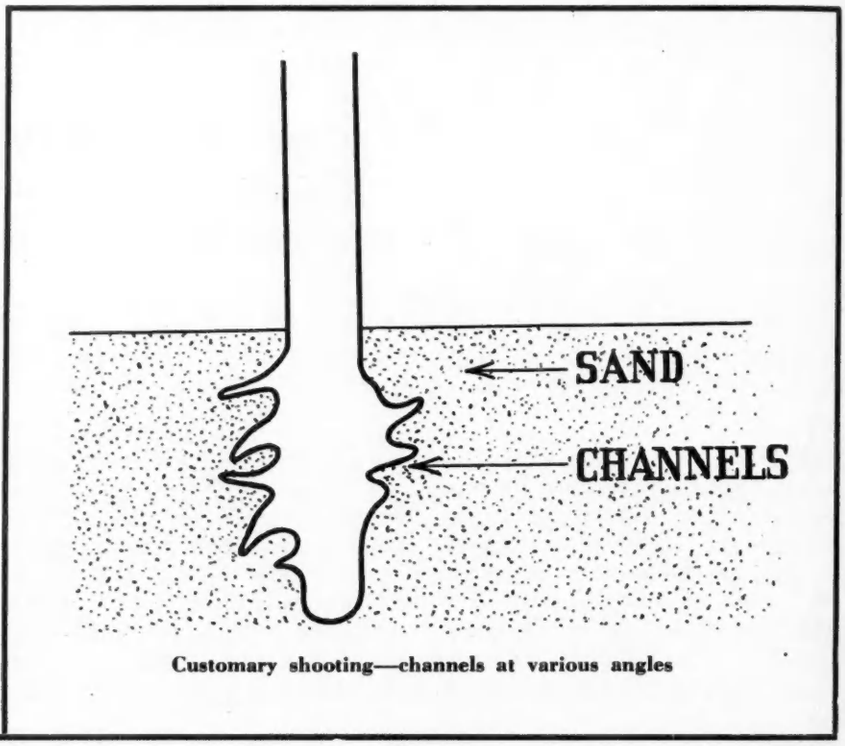
Prior to 1930, more than 90 percent of eastern stripper wells were brought into production by applying explosives to the entire length of the sand-face. Assuming that the blast exerted its force equally, yet following the course of least resistance, channels and fissures were made through the sand-body in various lengths and angles. As long as natural gas served as a driving force, oil flowed into the reservoir but when gas pressure waned the parallel and ascending channels became clogged with fluid. In re-drilling such territory, effort is being made to open clogged channels and force new ones through the sand at an angle that will permit natural drainage into the well. The method, which originated in the shallow oil fields of southern Ohio, is to drill entirely through the pay sand, and in its very lowest portion, make a cavity capable of holding 300 to 500 pounds of nitroglycerine, gelatin, 90 percent strength, or its equivalent in straight nitroglycerine. The cavity is made by pop-shooting the lowest six-foot portion of the sand-face

with 25 to 50 pounds of dynamite or gelatin. Spoil is removed by suction bailer. Into this cavity is then loaded the main charge, the amount being determined by the thickness and texture of the sand. (The general rule is 100 pounds of explosive to each 10 feet of sand.) The charge is lowered either in the customary metal container or released loose in the cavity, and since it must be fired electrically, two No. 8 electric blasting caps are taped into the pack. Insulated copper wire of length sufficient to reach from the explosive up the hole to the firing position outside completes the loading process and after it has been drawn taut and anchored, about 20 barrels of water are released down the hole. This stemming is weighted still more by pouring down 20 or 30 pounds of sand. When the sand has settled through the water and snugly around the pack, casing is pulled from the well, and the charge fired by blasting machine or battery.

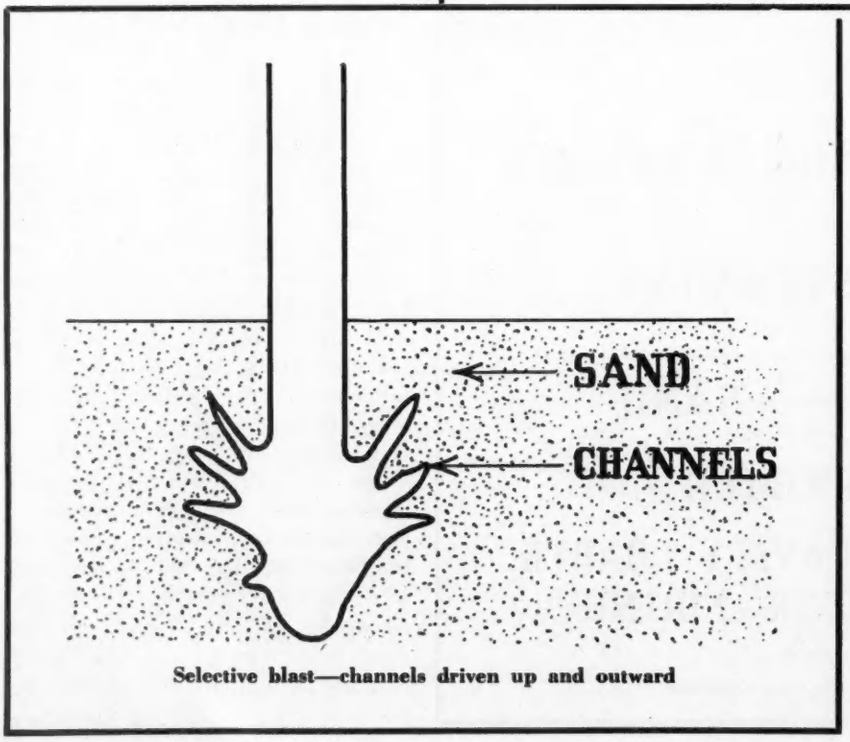
Loaded in this position in the sand, it can be an accepted fact that the major force of the blast is upward against the sand-body instead of side-wise, as is the case when blasting the entire sand face and channels of necessity are forced upward and outward. All such channels provide free, natural drainage into the well.

In districts where salt-water is prevalent the method is less popular because the extreme low portion of a sand is usually heavily impregnated with water, and a blast at that point increases its volume accordingly. In many cases however, increased production of virgin oil repays the extra cost of exhausting the water, and in wells of more than average sand depth it is often possible to leave the bottom intact, and make the receiving cavity higher up in the sand-face. In localities where pay-sands average less than 12 feet in thickness good results are obtained by forming the receiving cavity in the shales directly underneath.

The basic principle in all cases is to place the explosive so that the major driving force is exerted upward and outward against the body of the sand. Sand texture and thickness influence the extent of the drainage area more than does the amount and type of explosive, but in practically all sands, drainage is more complete than when the entire face is blasted.



Customary shooting—channels at various angles



Selective blast—channels driven up and outward

In the customary manner of redrilling stripper territory, (sinking a new well between two or more abandoned ones), selective or directional shooting makes it possible not only to open fresh channels, but also to tap clogged channels in the area of the abandoned wells. This makes fewer locations necessary in a given field. There is less cleaning, and due to less paraffin, wells remain in production over a longer period of time.

Pressure Maintenance Keeps Chalk Hill Wells Flowing

By JOHN C. ALBRIGHT

Forty percent of the wells in this eight year old field are still flowing, whereas nearby districts are dependent on pumping

FORTY percent of the wells on production flowing 8 years after discovery of the field sounds like an incredible situation, especially when in an area generally regarded as a pumping district. But the fact remains that Deep Oil Development Company and Bolin & Lindsay own a property in the Chalk Hill field of Archer County, Texas, which is performing in that manner. The answer is: pressure maintenance. The procedure followed required no elaborate research program.

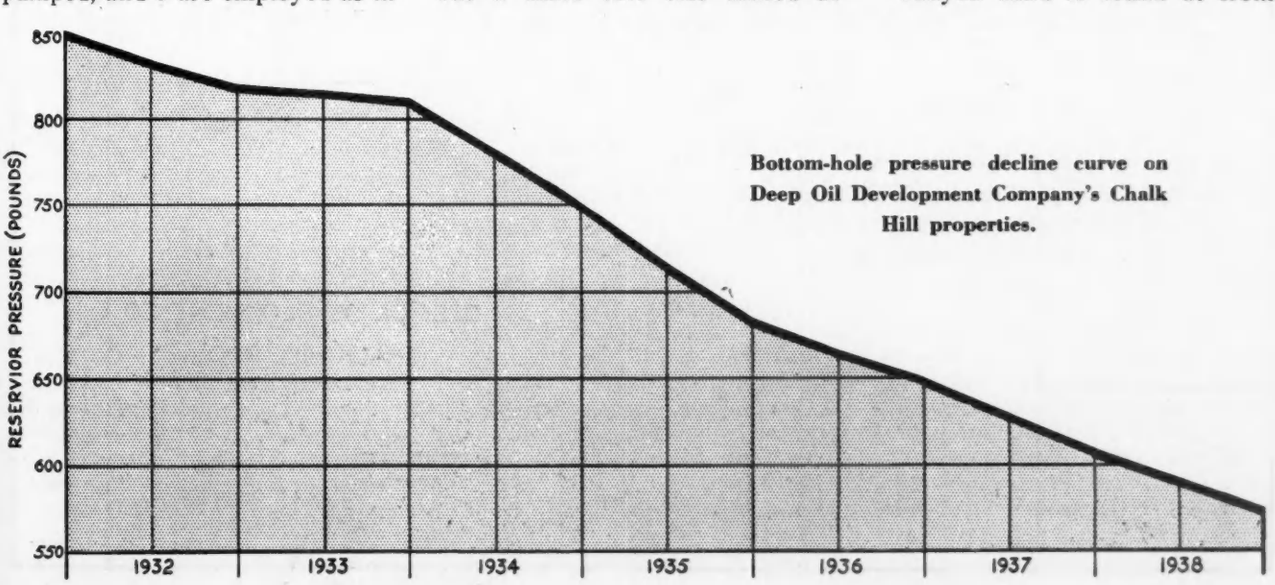
Out of an area of approximately 950 acres which have been proven productive in a group of leases amounting to about 2000 acres in the Chalk Hill section of the L. F. Wilson Ranch Estate, these companies, working jointly, have produced over 2,400,000 barrels of oil in the past 8 years of an estimated 8,135,000 barrels ultimate yield. Of 36 wells completed in the Canyon sand, 14 are making their allowable by natural flow, 17 are being pumped, and 5 are employed as injection wells. The properties have 2 additional wells which are bottomed in the Strawn and are not affected by the repressuring program.

Early Development Retarded

Deep Oil Development Company is an organization of Wichita Falls business men who long ago were convinced that oil could be found in formations deeply buried beneath the shallow sands which have consistently produced in North Texas since Electra was opened many years ago. Experienced oil men in many localities flouted the idea of deep production in this area, but a cable tool test drilled in Chalk Hill in February, 1931, started off with a daily production of 650 barrels in the Canyon, picked up at 2216 feet.

Due to depressed business conditions generally and the low price prevailing for oil at that time, efforts were not made to develop the property. In 1935, however, drilling was resumed, the parties completing 36 producing wells and 3 failures in the Canyon. The failures are principally in the northeast section of the block, where the structure contains water. Deeper exploratory work resulted in discovering small producers at 3600 feet in the Strawn.

Canyon sand is found at from



Bottom-hole pressure decline curve on Deep Oil Development Company's Chalk Hill properties.

2191 to 2256 feet with 12 to 20 feet of productive formation penetrated. The first few wells, completed with cable tools required the usual number of strings of casing, varying from 20-inch, 90-pound O.D., to 7 inch. The oil strings were set with 50 sacks of cement; none of the wells were shot with explosive. Early completions had bottom-hole pressures of around 850 pounds, which began to fall off rapidly. To combat this condition, the nucleus of the present pressure plant was commenced in 1933. This plant has since been enlarged until it has a capacity of 1,250,000 cubic feet of gas daily with a discharge pressure of 900 pounds, gauge.

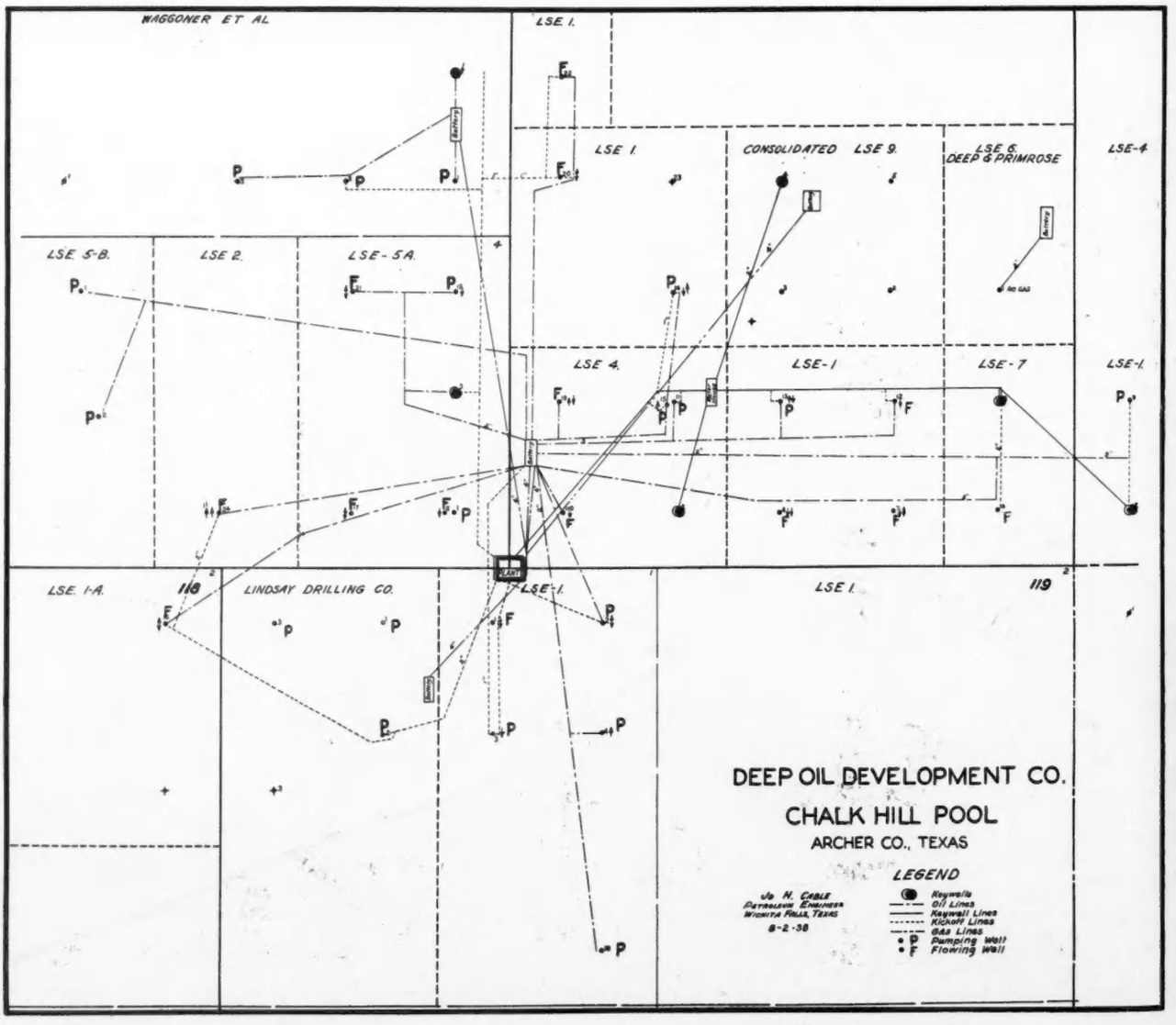
The pressure plant was designed for injection of residue and purchased dry gas into the sand and to extract the desired gasoline fractions from the gas taken into the plant from the oil and gas separators at the lease batteries. Engines employed for power are 2-cycle, vertical 2-cylinder oil burning units having horizontal cylinder compressors connected with belts. Oil burning engines, ranging from 37½ to 150 horsepower to provide a flexibility of the plant not available with extremely large engines, were selected because of the local shortage of fuel gas. One Diesel engine is rated at 150 horsepower, four others at 75 horsepower, and two at 37½ horsepower.

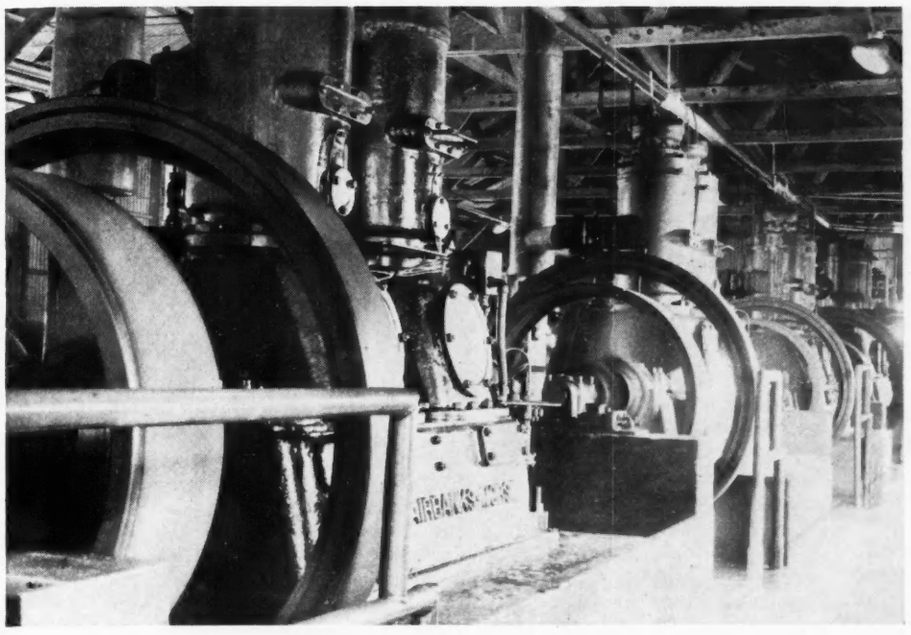
Input Wells

As the wells were completed without shooting, the formation was undisturbed, and clean holes were the rule. The wells selected for input of the repressuring gas were spotted across the property to provide an even distribution of the input gas, to maintain the reservoir pressure, and to move the oil to the producing wells. Holes selected for input wells were producers at the time of installing the repressuring plant and were not drilled for the purpose. The wells were not selected on a geometrical pattern, but were picked so oil from the edge of the structure might be driven toward the center, and on the northeast side to hold back the travel of water.

A distribution system was laid over the pool to transport the gas, which is under a pressure of about 900 pounds. The input wells, being equipped with a string of 7-inch O.D. pipe, cemented at the bottom, an effective seal was provided against migration of the gas to extraneous formations. Connections were fitted to the casingheads to introduce the gas through the casing instead of through a string of packed tubing.

One well however, had a lens-like shale break in the main body of sand, exposing 9 feet in the upper section and 18 feet in the lower.





Interior of Deep Oil Development Company's pressure plant at Chalk Hill, showing part of the oil engines used to drive the compressors.

The shale was 2½ feet thick, and the two sections of sand apparently differed in density. Only 500 pounds pressure was required to introduce the gas into the upper section, while about 750 pounds was required for the lower 17 feet. This well was equipped with a string of tubing with a packer set in the shale break, and connections were made at both the casinghead and the tubing.

Pressure regulators and control valves were installed at each input well, with orifice meters set to provide a record of the amount of gas injected into each.

Gas Consumption

During the past year, an average amount of approximately 24,000,000 cubic feet of gas has been injected monthly, but injection will be stepped up to about 33,000,000 per month. The average amount of gas received by the compressors from the lease batteries has been about 32,500,000 cubic feet per month. This latter has a gasoline content of 2.638 gallons per thousand.

Gasoline extracted from the gas produced with the oil has averaged 82,178 gallons, all of which was stabilized down to 14 pounds, Reid. Butanes fractionated from the raw gasoline are being used or sold for drilling fuel. The gasoline side of the repressuring plant was built largely with a modern fractionating column to reduce the vapor pressure to that required for the markets available.

It has been estimated that the 950 proven acres eventually will produce 5,726,000 barrels of oil as a result of repressuring. This, added to the oil already removed from the Canyon sand, gives a total of 8,135,000 barrels to be recovered, or an ultimate recovery of about 8500 barrels per acre.

May Check Decline

The decline in reservoir pressure at Chalk Hill has been gradual since the pressure plant was built. As the original pressure was about 850 pounds, the decline has been at the rate of about 40 pounds per year. But with the acquisition of the approximate 300,000 cubic feet of purchased gas, it is considered unlikely that the pressures henceforth will be lowered appreciably from the present 575 pounds.

The ratio of injected gas to oil production has been about 900 cubic feet per barrel, while the ratio of produced gas to produced oil has been about 1200 cubic feet per barrel. The ratio of 14-pound gasoline to produced oil has averaged approximately 3.2 gallons per barrel.

Pressure Varied

Pressure at the pumping wells is varied to suit conditions, varying from 200 to 300 pounds on the tubing, and from 400 to 600 pounds on the casing. Back pressure is maintained to prevent channeling of the gas, and is changed any time a well indicates that it is producing with too high a gas/oil ratio. The field is prorated to a monthly production of 25,867 barrels, but has a capacity of over 1000 barrels daily without harming the pressure project.

Chalk Hill, similar in structure and general characteristics to many other pools in North and Central North Texas, gives up its natural pressure readily. But because of the program of returning gas to the sand through selected input well, the pressure has not declined as rapidly as it has in other pools of the district that do not utilize this method of producing. Basing a prediction upon the general behavior of other fields producing from the Canyon and other sands, it is probable that if a program of pressure-maintenance had not been placed in operation early in the life of Chalk Hill, all of the wells would be pumpers today. It is also reasonably certain, judging from results obtained in pools elsewhere which have pressure maintenance, that a greater ultimate recovery of oil will be obtained at Chalk Hills, with less expense per barrel than if the pressure had been permitted to fall.

Cost of a similar program in other fields can be determined only by an analysis of the problems and conditions of the pool involved. This includes calculation of the amount of pressure required to inject the gas into the formations, calculation of the amount of gas available, and consideration of facilities at hand or that may be provided for the recovery of natural gasoline. Under normal conditions, the amount received from sales of this latter product should go a long way toward covering the operating cost of the repressuring plant.

Mesozoic and Cenozoic Most Important Texas Producing Zones

By MARY CHALK DALTON, Geologist

A VAST portion of Texas, producing from the Mesozoic and Cenozoic formations, and embracing nearly one-half of the area of the state, has become one of the outstanding oil reserves of the world. Its importance has accelerated during the past few years, discovery rate of new fields increasing materially.

The trend embraces all the South, Eastern, and Gulf Coastal portions of Texas. On April 1, 1938, this area had 287 oil fields on production, their producible, developed reserves being calculated in the billions of barrels.

The successes of these explorations have created much interest as to the relative number of fields producing from the Mesozoic and Cenozoic, dates of discovery, drilling depths, structures, means of discovery, and types of producing horizons. These factors have been studied in detail, the results being in general as follows:

All oil fields located in the South, East, and Gulf Coast areas of Texas are producing from Mesozoic and Cenozoic formations. The Balcones fault, the major fault-line of Texas, extends from near Del Rio in Val Verde County to north of Waco in McLennan County and is traceable northward near Italy in Ellis County to near McKinney in Collin County. The fault roughly separates Mesozoic and Cenozoic oil-producing fields in Texas from those producing from the Paleozoic. All oil fields producing from Mesozoic and Cenozoic formations are under consideration in this paper. This includes 287 oil fields discovered up to April 1, 1938. Of this number 175 are located in South Texas, 85 in the Gulf Coast area, and 27 in East Texas. Figure 1 shows these districts.

Of the 287 oil fields of Texas under consideration 73 are producing from the Mesozoic and 114 from the Cenozoic. All fields in the Gulf Coast produce from the Cenozoic while in East Texas oil production is predominantly from the Mesozoic. In East Texas there are 24 fields producing from Mesozoic horizons with only three producing from the Cenozoic. The main formation here is the Woodbine sand which is a horizon sought by drillers, as it is found at comparatively shallow depths, the drilling conditions are favorable, and the average cost per well is comparatively low. In South Texas there are 126 fields producing from the Cenozoic

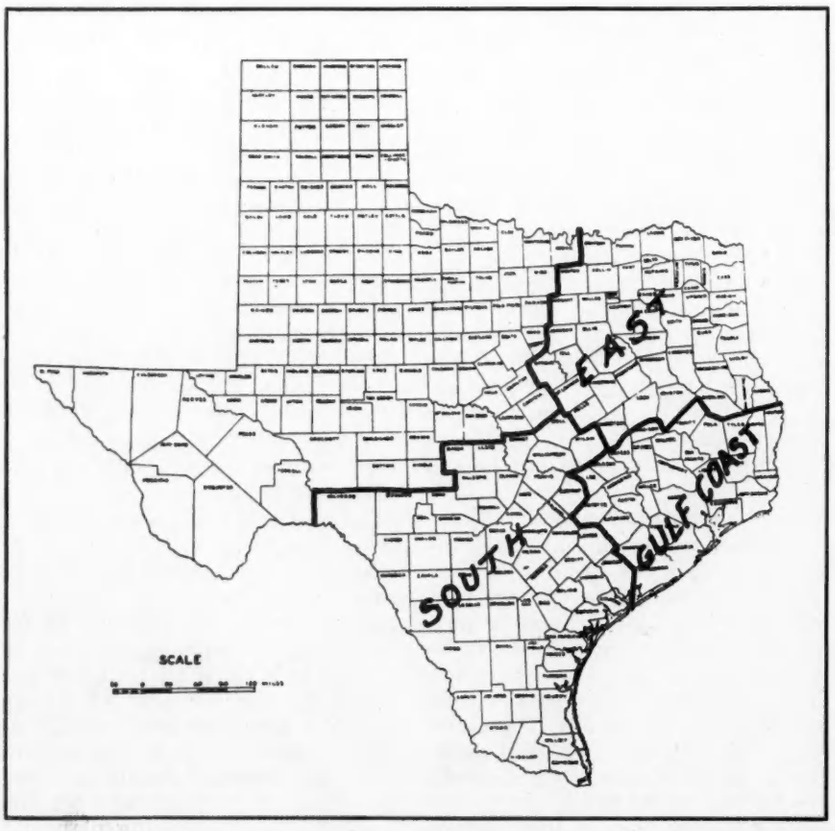


FIGURE 1

Districts in Texas that are producing from the Mesozoic and Cenozoic formations.

and 49 from the Mesozoic. In general, the production of oil from the Cenozoic is confined to extreme South Texas and to the coast, while production from the Mesozoic occurs in South Central Texas in Bexar, Medina, Bastrop and Caldwell counties.

Oil development in Texas began with the discovery of a 30-barrel well at Oil Springs, Nacogdoches County, in 1886. It was at Corsicana, in Navarro County, in 1896 where a well being drilled for water hit an oil-bearing sand that the commercial development of oil started in Texas. It was not until about 25 years later that another field of such significance was discovered in this area. The Mexia pool, Limestone County, first of the Balcones fault fields, was discovered in 1920. In 1929 the Van field, Van Zandt County, was responsible for the first production from the East Texas Basin, and subsequent wildcatting finally resulted in the discovery of the East Texas field in 1930 which has become the largest oil field in the world.

The discovery of Spindletop in 1901 was the beginning of modern oil industry in Texas. Unprecedented interest in the oil industry ensued and soon this field was followed by the discovery of many others in that area.

In considering South Texas, it was found that shallow fields have been producing in that area as early as 1904. These fields are located in Bexar and Medina counties. The first field of any importance in this district was the Somerset field of Bexar and Atascosa counties which produces from the Navarro formation. There are also several serpentine oil fields that have been producing for a relatively long time. Thrall in Williamson County was the first important serpentine oil field, and was discovered in 1915. In 1922 the Luling field in Caldwell County came in as the first large field producing from the Edwards limestone.

Experimental drilling in the Mirando district did not locate a productive field until 1913 when the Charco Redondo field of Zapata County produced from shallow depths.

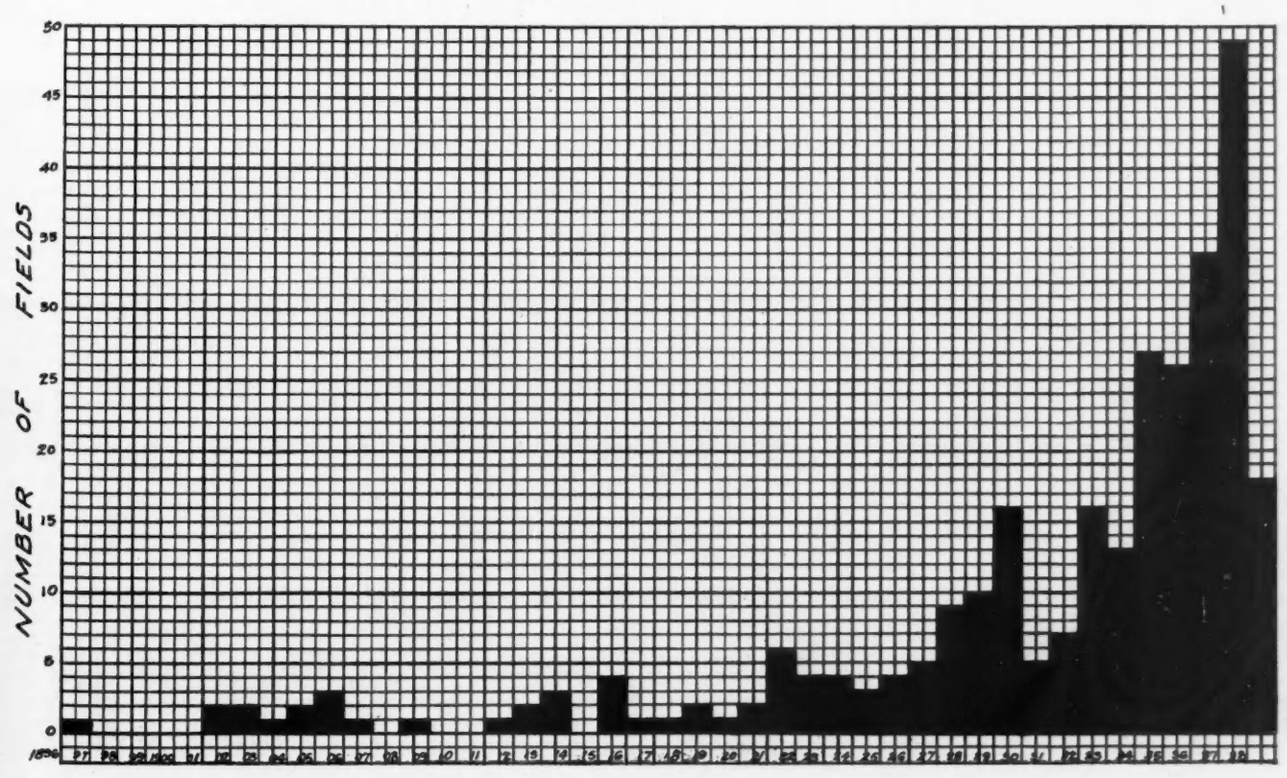
The Corpus Christi locality in the South Texas district has been producing oil and gas since 1919, but it was formerly known as a gas area. The area was discovered with the drilling of the White Point field, San Patricio County in 1919. Several test wells drilled on the north side of Corpus Christi Bay in San Patricio County blew from shallow gas and cratered, and it was not until 1937 that oil production was realized in this vicinity. The first pool of any size in this district was the Kingsville field of Kleberg County which was designated as a gas field in 1912 and produced oil in 1920. Saxet, Nueces County, was the first million-barrel oil pool in South Texas. The Saxet field was discovered in 1923.

Development in the Rio Grande Valley district with respect to oil opened in 1935 with the discovery of the Los Olmos pool of Starr County which produced gas at first and was followed by the production of oil a few years later.

Figure 2 shows the number of fields discovered in the area covered by these three districts since 1896. It is interesting to observe the fluctuations in the number of fields discovered since the Corsicana pool of 1896. There were few discoveries prior to 1920. During 1927 more oil field discoveries are noted than at any time previous. Noticeable increases occur in 1928 and 1929. The years 1930 and 1931 were depression years with respect to oil discovery and a definite slump is evident during this time. Since 1932 there has been a steady increase in the number of fields

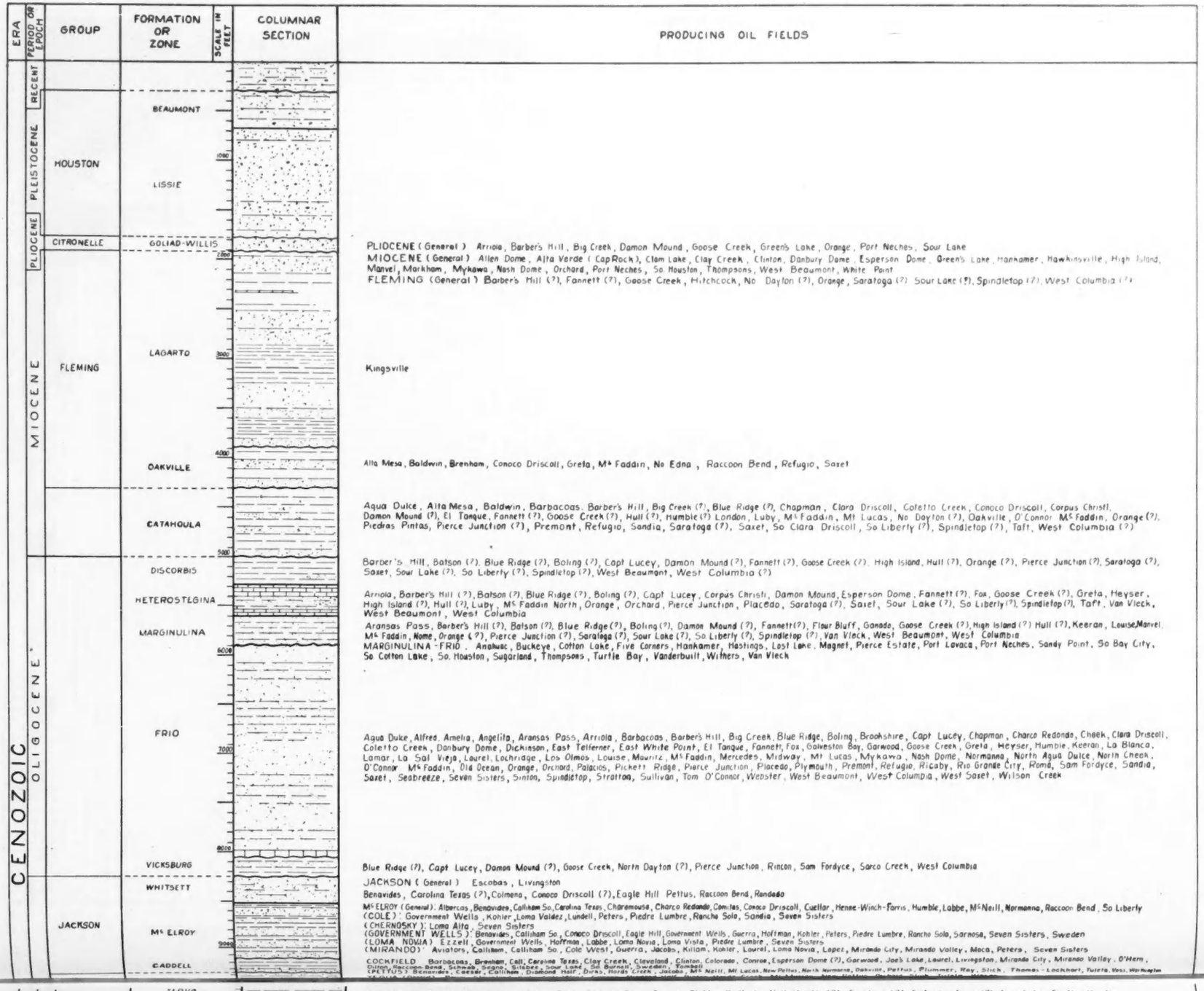
FIGURE 2

Number of oil fields producing from the Mesozoic and Cenozoic formations of Texas discovered each year since 1896.



Generalized Columnar Section of Mesozoic and Cenozoic of Texas

Prepared by Mary Dalton, May, 1938.


ERA
PERIOD OR EPOCH
GROUP
FORMATION OR ZONE
SCALE IN FEET
COLUMNAR SECTION
PRODUCING OIL FIELDS
CENOZOIC
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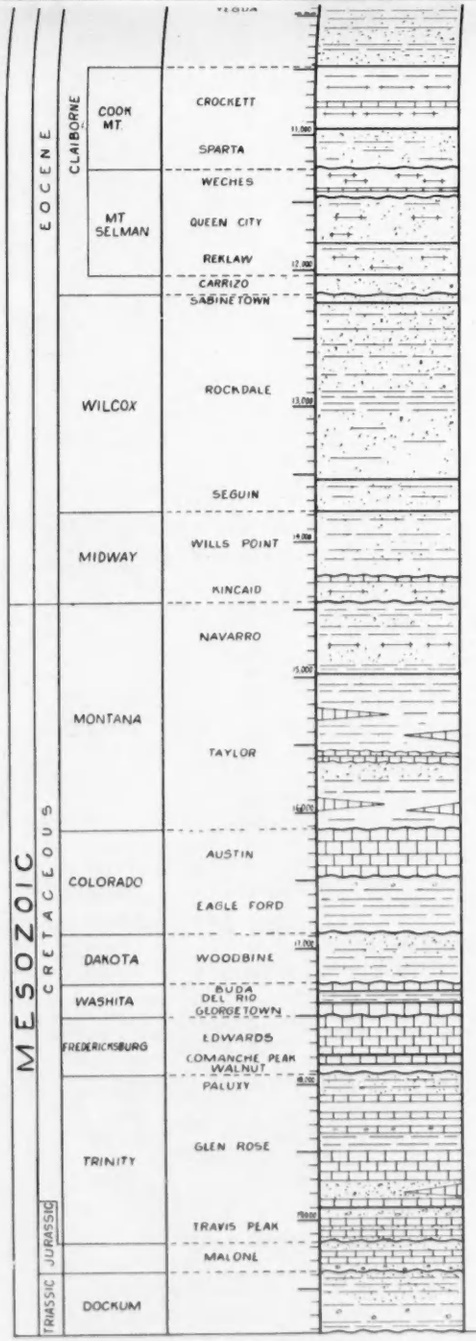
PLIOCENE
MIOCENE
OLIGOCENE
HOUSTON
BEAUMONT
LISSIE
CITRONELLE
GOLIAD-WILLIS
FLEMING
LAGARTO
OAKVILLE
CATAHOULA
DISCORBIS
HETEROSTEGINA
MARGINULINA
FRIO
VICKSBURG
JACKSON
WHITSETT
Mc ELROY
CADDELL
1000
3000
4000
5000
6000
7000
8000
9000
PLIOCENE (General) Arriola, Barber's Hill, Big Creek, Damon Mound, Goose Creek, Green's Lake, Orange, Port Neches, Sour Lake
MIOCENE (General) Allen Dome, Alta Verde (CapRock), Clam Lake, Clay Creek, Clinton, Danbury Dome, Esperson Dome, Green's Lake, Hankamer, Hawkinsville, High Island, Manvel, Markham, Mykawa, Nash Dome, Orchard, Port Neches, So. Houston, Thompsons, West Beaumont, White Point
FLEMING (General) Barber's Hill (?), Fannett (?), Goose Creek, Hitchcock, No Dayton (?), Orange, Saratoga (?) Sour Lake (?), Spindletop (?), West Columbia (?)
Kingsville
Alta Mesa, Baldwin, Brenham, Conoco Driscoll, Greta, Mc Faddin, No Edna, Raccoon Bend, Refugio, Saxet
Aqua Dulce, Alta Mesa, Baldwin, Barbacoas, Barber's Hill, Big Creek (?), Blue Ridge (?), Chapman, Clara Driscoll, Coletto Creek, Conoco Driscoll, Corpus Christi, Damon Mound (?), El Tanque, Fannett (?), Goose Creek (?), Hull (?), Humble (?) London, Luby, Mc Faddin, Mt Lucas, No Dayton (?), Oakville, O'Connor Mc Faddin, Orange (?), Piedras Pintas, Pierce Junction (?), Premont, Refugio, Sandia, Saratoga (?), Saxet, So Clara Driscoll, So Liberty (?), Spindletop (?), Taft, West Columbia (?)
Barber's Hill, Batson (?), Blue Ridge (?), Boling (?), Capt Lucey, Damon Mound (?), Fannett (?), Goose Creek (?), High Island, Hull (?), Orange (?), Pierce Junction (?), Saratoga (?), Saxet, Sour Lake (?), So Liberty (?), Spindletop (?), West Beaumont, West Columbia (?)
Arriola, Barber's Hill (?), Batson (?), Blue Ridge (?), Boling (?), Capt Lucey, Corpus Christi, Damon Mound, Esperson Dome, Fannett (?), Fox, Goose Creek (?), Greta, Heyser, High Island (?), Hull (?), Luby, Mc Faddin North, Orange, Orchard, Pierce Junction, Placedo, Saratoga (?), Saxet, Sour Lake (?), So Liberty (?), Spindletop (?), Taft, Van Vleck, West Beaumont, West Columbia
Aransas Pass, Barber's Hill (?), Batson (?), Blue Ridge (?), Boling (?), Damon Mound (?), Fannett (?), Flour Bluff, Ganado, Goose Creek (?), High Island (?) Hull (?), Keeran, Louise, Manvel, Mc Faddin, Nome, Orange (?), Pierce Junction (?), Saratoga (?), Sour Lake (?), So Liberty (?), Spindletop (?), Van Vleck, West Beaumont, West Columbia
MARGINULINA-FRIO. Anahuac, Buckeye, Cotton Lake, Five Corners, Hankamer, Hastings, Lost Lake, Magnet, Pierce Estate, Port Lavaca, Port Neches, Sandy Point, So Bay City, So Cotton Lake, So. Houston, Sugarland, Thompsons, Turtle Bay, Vanderbuilt, Withers, Van Vleck
Aqua Dulce, Alfred, Amelia, Angelita, Aransas Pass, Arriola, Barbacoas, Barber's Hill, Big Creek, Blue Ridge, Boling, Brookshire, Capt Lucey, Chapman, Charco Redondo, Cheek, Clara Driscoll, Coletto Creek, Danbury Dome, Dickinson, East Telferner, East White Point, El Tanque, Fannett, Fox, Galveston Bay, Garwood, Goose Creek, Greta, Heyser, Humble, Keeran, La Blanca, Lamar, La Sal Vieja, Laurel, Lochridge, Los Olmos, Louise, Mauritz, Mc Faddin, Mercedes, Midway, Mt Lucas, Mykawa, Nash Dome, Normanna, North Agua Dulce, North Creek, O'Connor Mc Faddin, Old Ocean, Orange, Orchard, Palacios, Pickett Ridge, Pierce Junction, Placedo, Plymouth, Premont, Refugio, Ricaby, Rio Grande City, Roma, Sam Fordyce, Sandia, Saxet, Seabreeze, Seven Sisters, Sinton, Spindletop, Stratton, Sullivan, Tom O'Connor, Webster, West Beaumont, West Columbia, West Saxet, Wilson Creek
Blue Ridge (?), Capt Lucey, Damon Mound (?), Goose Creek, North Dayton (?), Pierce Junction, Rincon, Sam Fordyce, Sarco Creek, West Columbia
JACKSON (General) Escobas, Livingston
Benavides, Carolina Texas (?), Colmena, Conoco Driscoll (?), Eagle Hill Pettus, Raccoon Bend, Randado
Mc ELROY (General): Albercas, Benavides, Callihan So, Carolina Texas, Charemouse, Charco Redondo, Comitas, Conoco Driscoll, Cuellar, Henne-Winch-Farris, Humble, Labbe, Mc Neill, Normanna, Raccoon Bend, So Liberty
(COLE): Government Wells, Kohler, Loma Valdez, Lundell, Peters, Piedre Lumbre, Rancho Solo, Sandia, Seven Sisters
(CHERNOSKY): Loma Alta, Seven Sisters
(GOVERNMENT WELLS): Benavides, Callihan So, Conoco Driscoll, Eagle Hill, Government Wells, Guerra, Hoffman, Kohler, Peters, Piedre Lumbre, Rancho Solo, Sarnosa, Seven Sisters, Sweden
(LOMA NOVIA) Ezzell, Government Wells, Hoffman, Labbe, Loma Novia, Loma Vista, Piedre Lumbre, Seven Sisters
(MIRANDO) Aviators, Callihan, Callihan So., Cole West, Guerra, Jacobs, Killam, Kohler, Laurel, Loma Novia, Lopez, Miranda City, Miranda Valley, Moca, Peters, Seven Sisters
COCKFIELD Barbacoas, Brenham, Call, Carolina Texas, Clay Creek, Cleveland, Clinton, Colorado, Conroe, Esperson Dome (?), Garwood, Joe's Lake, Laurel, Livingston, Miranda City, Miranda Valley, O'Hern, Olton, Raccoon Bend, Schwab, Segno, Silsbee, Sour Lake, Sul Burnett, Sweden, Tombell
(PETTUS) Benavides, Caesar, Callihan, Diamond Half, Dirks, Hords Creek, Jacobs, Mc Neill, Mt Lucas, New Pettus, North Normanna, Oakville, Pettus, Plummer, Ray, Stick, Thomas-Lockhart, Tuleta, Voss, Warhaftig
(UPPER SALINE BAYOU) Batson, Carolina Texas, Esperson Dome, Eureka, Ft Merrill, Hardin, Hull, Humble (?), Saratoga (?), Satsuma, Segno (?), Sour Lake, South Liberty
(LOWER SALINE BAYOU) Batson (?), Fairbanks, Hull, Humble, Saratoga (?)

Texas Showing Stratigraphic Positions of Oil Producing Fields

Modified from Sellard's University of Texas Bulletin 3401.



(UPPER SALINE BAYOU) Batson, Carolina Texas, Esperson Dome, Eureka, Ft Merrill, Hardin, Hull, Humble (?), Saratoga (?), Satsuma Segno (?), Sour Lake, South Liberty

(LOWER SALINE BAYOU) Batson (?), Fairbanks, Hull, Humble, Saratoga (?)

Joe's Lake

MT SELMAN (General) Clay Creek
Ginter

Carolina Texas, Huntington, Roma

Trinity

Trinity
WILCOX (General) Clay Creek

NAVARRO-KINCAID CONTACT Buchanan, Mission
NAVARRO (General) Alta Vista, Berlin New, Chicon Lake Eckert, Jones, Pearsall Somerset, Southton Von Ormy Zaboroski
(ESCONDIDO) Ina
(NACATOCH) Bethany, Van

TAYLOR-NAVARRO CONTACT Corsicana Shallow, Minerva Rockdale, Taylor
TAYLOR (General) Carver-Kallison, Chicon Lake, Darst Creek, Deupree Dunlap Eckert, Gas Ridge, Mission, Somerset
(DALE) Bateman, Dale

(ANACACHO) Medina Farms

(SERPENTINE) Buchanan, Carroll, Cedar Creek Cedar Creek North Chapman-Abbot Chicon Lake, Hilbig, Kimbro, Lytton Springs Manda, Noack, Thrall, Yost

Alta Vista Bethany (Blossom) Branyon, Buchanan, Burdette Wells Clark, Darst Creek Deupree Dunlap Hanna-Nelson, Larremore, Luling, Manford, Pearsall, Potter, Salt Flat Staples, Zaboroski

Van

Boggy Creek Cayuga Currie Pool East Texas Grapeland, Long Lake, Mexia, Percilla Powell Pool, Richland Rusk, Van Wortham

Lott, Pearsall Post Oak

Batesville New, Branyon, Buchanan, Burdette Wells, Darst Creek, Larremore, Lost Mule, Luling, Manford, Pearsall Salt Flat

South Bosque
Sulphur Bluff, Talco
TRINITY (General) Vinegarone

Rodessa Shelbyville

discovered with an impressive climax in 1937, during which 49 fields were discovered in the three districts under consideration. South Texas not only surpassed East Texas and the Gulf Coast areas in oil field discoveries during 1937, but led the world as well. During this time 32 new fields were brought in and new producing zones were discovered in already established fields. There were 13 new fields discovered in the Gulf Coast area in addition to the finding of new producing sands in old fields. There were four new fields discovered in East Texas and a few new sands were discovered in oil fields of that area.

Oil development in these three districts during 1938 is very promising and up to April 1, 1938, 18 new fields had been discovered. Exploration of deeper zones is proving satisfactory and it is impossible to predict the oil production of the future.

Means of Discovery

Increase in the number of fields being discovered in the past few years may in some way be due to the much improved methods of oil exploration. The history of exploration of oil in Texas is one of progression from early haphazard methods to the more accurate procedures developed by modern science. The early prospectors drilled many of their wells with nothing more than a "hunch" to guide them.

Because of the tremendous cost of drilling, the oil industry has demanded more definite information than a mere "hunch" before putting down wells, and oil prospecting has developed into a more exacting procedure which utilizes specifically trained men and especially designed instruments for oil exploration. Many branches of science have been united in order to attempt to develop a definite means of discovery of oil. Geology, physics, chemistry, engineering, mathematics, photography, and aviation are used conjunctively to help eliminate to some extent the vast amount of uncertainty employed in the location of fields.

A prospector is attracted to a location in many cases by surface indications which include: oil seeps, gas seeps, paraffin dirt, mineral waters, and bituminous outcrops.

Where oil seeps in some instances might be considered fairly accurate evidences of the presence of oil, in general, surface indications must be considered of secondary importance. These "guides" are still not far enough away from the early "wildcatter."

A geologist is often attracted to a particular location because of rumors of certain of these surface indications, but he supplants this information with his more scientific and keener observations. Geological work is of two kinds—surface and subsurface. Surface geology is generally used first. Surface and subsurface geology are correlated in that a study of the surface and its structural relations serve as a guide to the subsurface conditions that may exist, and thus aid in predicting the most favorable site for the location of a test well. However, successful mapping of subsurface structure from the surface features is only satisfactory in regions where the topography is rough and the formations dip steeply. In areas where the land is of low relief as illustrated by the coastal prairies of Texas, the geologist has trouble in mapping structure. In cases of this kind, methods of subsurface geology in addition to the location of highs or faults on subsurface regional maps are employed. These include "core-holing" with interpretation of the subsurface and by the use of electrical and paleontological logs.

Within the last decade geophysical instruments have become prominent as successful oil exploration tools.

There is an evident combination of geology and geophysics. The importance of the field geologist who passes on the area before work starts and who often attempts to find surface indications that will aid work must not be forgotten. He checks the data and studies the position of the formations involved.

In close relation to "wildcatting" is "trend-play" which has been responsible for the finding of many fields. Trend-play refers to that practice whereby location for wells is determined from previous wells. The direction of the field is determined and wells are drilled along that particular line. The Luling field was found to lie along a fault and other fields following it have been drilled along that fault with notable success.

A summary of the various exploration methods used in the discovery of fields is given in Table 3. In Table 3, a general tabulation has been made of all the discovery means of these fields including every method used for each particular field. In some cases, of course, this involves more than one means. No distinction is made as to what might be considered the outstanding procedure in each field as this is largely a matter of personal opinion. The purpose of the summary is to indicate the number of times a particular method has been followed with no reference to whether it is the sole exploration means or whether it has been accompanied by other methods.

But with all these means of discovery it is the combination of technical and practical ability that meets with the most success. Geology is not an exact science, and good judgment and practical experience are greater assets than mere academic training. The geologist lacks a great deal of being infallible and he can only predict favorable locations for the drilling of wells. Methods of exploration have made great advancements and they are aiding a great deal today in the prediction of deeper pay horizons which are being sought because they have recently proved productive.

TABLE 3

Summary of Various Exploration Methods Used in the Discovery of Fields

	East Texas	Gulf Coast	South Texas	Total
Geology	..	..	116	116
Sub-Surface Geology	3	4	14	21
Surface Geology	11	34	19	64
Geophysics	6	61	46	113
Wildcat	10	..	7	17
Trend-Play	3	2	42	47
Gas Seeps	..	23	2	25
Paraffin Dirt	..	8	..	8
Oil Seeps	..	..	2	2
Mineral Water	..	13	..	13

Drilling Depths

There is a definite trend toward deeper drilling in all the areas under consideration. In East Texas drilling is penetrating the lower Cretaceous beds of Glen Rose age. Rodessa field, Cass and Marion counties, discovered in 1935, was

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Through the Portable Drilling Corporation, records were kept on the performance of the two D13000 engines operating this No. 51 Unit Rig. A report of last spring includes this interesting information:

"The No. 51 Unit Rig has been in continual service from the time it left our plant in the month of September, 1936. . . . It drilled through the worst dust period in the dust bowl area of the Panhandle. Yet the engines performed admirably and with a very minimum of trouble. We feel that the D13000 Diesel Engines are unmatched for oil-well service."

There's considerably more to the recorded experience with this and another rig that is similarly powered with "Caterpillar" Diesel Engines. For instance: The average fuel cost for each of seven consecutive wells (averaging 4114 feet) was only $206.50. . . . And there's a great deal more to the story of "Caterpillar" Diesel Engines — particularly the rapidity with which they have become the most popular drilling power in the oil-fields. If interested in dependable drilling power, drop us a line.

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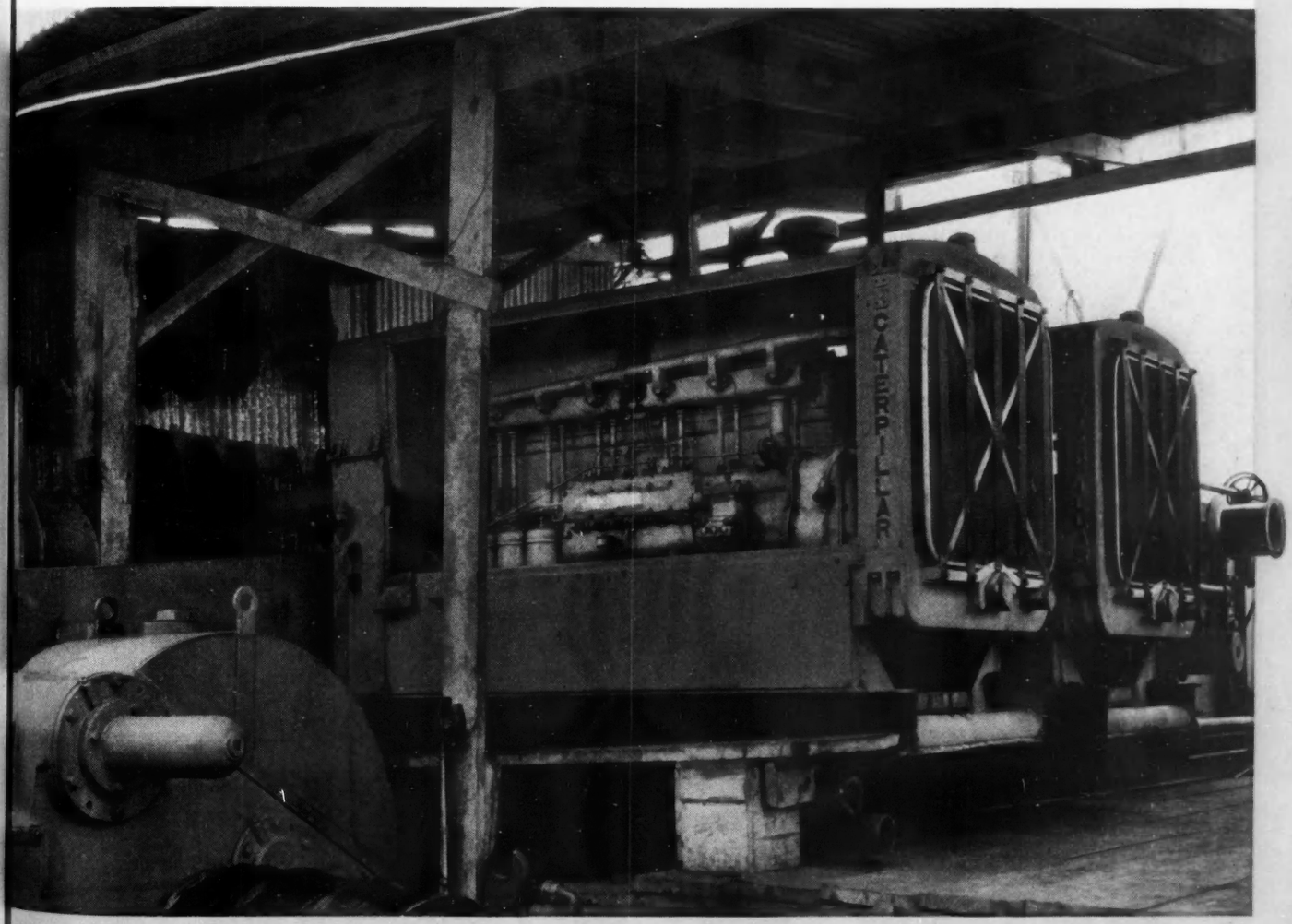

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the first major Glen Rose pool and it has already produced over 40,000,000 barrels from this formation at a depth of about 6000 feet. Shelbyville, Shelby County, discovered in 1936, also produces from the Glen Rose at a depth of 5025 feet. Sulphur Bluff, Hopkins County, and Talco, Franklin and Titus counties, discovered in 1936, are producing from the Paluxy sand of uppermost Trinity at depth of 4467 to 4500 feet and 4028 feet respectively. Talco was the first to open the production in this sand zone and Sulphur Bluff followed within a few months. Both of these fields are considered excellent examples of deep production. Deepest production in this area occurs in the Opelika field in Henderson County, which is producing distillate and oil at a depth of 7185 to 7195 feet. This is one of the newer fields of the district and was discovered in 1937. Grapeland field, Houston County, is one of the deeper producers from Woodbine sand. This field was discovered in 1937 and is producing from the Woodbine at a depth of about 6075 feet.

In South Texas drilling depths are also increasing, with exploration drilling exceeding 10,000 feet. It is interesting to trace the trend toward deeper production in this area. In the Balcones fault zone of South Central Texas, drilling in serpentine, Navarro, Austin, and Edwards has been in depths ranging from 100 to 2750 feet. The older fields of Bexar, Medina, Bastrop, and Caldwell counties have, in general, been producing from shallow depths. One of the oldest of these is the almost extinct field of Mission in Bexar County, discovered in 1904, and producing from a depth of 100 to 1100 feet. Alta Vista, also of Bexar County, discovered in 1912, is producing at a depth of 250 feet from the Navarro and at 1100 feet from the Austin. The newer fields, however, are realizing production at much greater depths. The Pearsall field, Frio County, discovered in 1934, is producing from the Edwards formation at 6230 feet.

In the Mirando district production was brought in from depths of 700 to 3000 feet. The Mirando City field, discovered in 1921, produces from the Hockleyensis zone at 1540 feet and from the Cockfield at 1935 feet. The recent fields of this district show production at greater depths also. Sweden field of Duval County is producing from the Cockfield at 5850 feet.

In the Pettus district production was encountered at a depth of about 4200 feet. The Pettus sand is the most prolific producer in this district. The Pettus field in Bee County, discovered in 1939, produces oil from the Whitsett formation at 2950 feet and the Pettus sand member of the Cockfield at 3900 feet. McNeill in Live Oak County, discovered in 1934, produces from the Pettus sand at a depth of 5000 feet.

The deepest production in the South Texas district occurs in the coastal region with the majority of fields formerly producing at a depth of about 4500 feet. The Corpus Christi field is producing in the Heterostegina zone at 5100 feet.

The Vinegarone field of Val Verde County, discovered in January, 1938, is creating interest because wells in this field are producing from the Lower Cretaceous. Production is reached at the shallow depth of 296 to 301 feet from the Trinity. There is evidence of further production in this district from Lower Cretaceous formations.

TABLE 1

Summary of Productiveness in Fields According to Depths

DEPTH	East Texas	Gulf Coast	South Texas	Total
0– 500	1	3	13	17
500– 1,000	1	11	28	40
1,000– 1,500	5	17	26	48
1,500– 2,000	2	13	35	50
2,000– 2,500	4	14	47	65
2,500– 3,000	4	21	31	56
3,000– 3,500	4	28	18	50
3,500– 4,000	3	31	22	56
4,000– 4,500	2	29	20	51
4,500– 5,000	1	28	18	47
5,000– 5,500	2	22	24	48
5,500– 6,000	3	29	20	52
6,000– 6,500	2	14	10	26
6,500– 7,000	..	16	7	23
7,000– 7,500	1	8	1	10
7,500– 8,000	..	7	5	12
8,000– 8,500	..	6	..	6
8,500– 9,000	..	3	..	3
9,000–10,000	..	2	..	2
10,000 plus	..	1	..	1

In the Gulf Coast area drilling has also been increasing, and, in fact, it is here that the greatest drilling depths have been reached of any of the three districts under discussion. Wells in Old Ocean, Brazoria County, discovered in 1934, have reached a producing depth of 10,670 feet. Production generally occurs at comparatively greater depths than in either of the two other areas. However, Batson in Hardin County wields production at the shallow depth of 350 feet. Brenham, in Austin and Washington counties produces from depths of 190 to 402 feet. These are exceptions rather than the rule, and in general, fields produce chiefly in zones below 3000 feet.

The Gulf Coast area presents exceptional opportunities for the development of oil at record depths. The great thickness of the productive formations, and the good drilling conditions favor deeper drilling in this area. Interest was not shown in deeper pay zones of the Gulf Coast district until a few years ago and since then there have been extensive geophysical surveys made of the area. It was then that the great thicknesses of the Coastal formations was realized. It was found that the Tertiary beds thicken toward the coast, and deep drilling near Galveston and Houston shows that the Tertiary and Upper Cretaceous beds a short distance from the coast line exceed 19,000 feet in thickness. This thickness is due to the former presence of a great geosyncline which extended along the coast.

The Frio formation holds the major interest of the drillers in this region and because of its stupendous thickness, offers untold possibilities for deep production. The underlying formations such as the Cockfield, Upper Saline Bayou, and Lower Saline Bayou present themselves as possible favorable deep producing sands.

Table 1 gives a summary of production in fields according to depths.

Structure

The accumulation of petroleum depends upon geological structures. There are many types of structures favorable for the accumulation of petroleum but in this paper only the following will be discussed: anticlines, domes, monoclines, faults, sand lenses, terraces, noses, and igneous intru-

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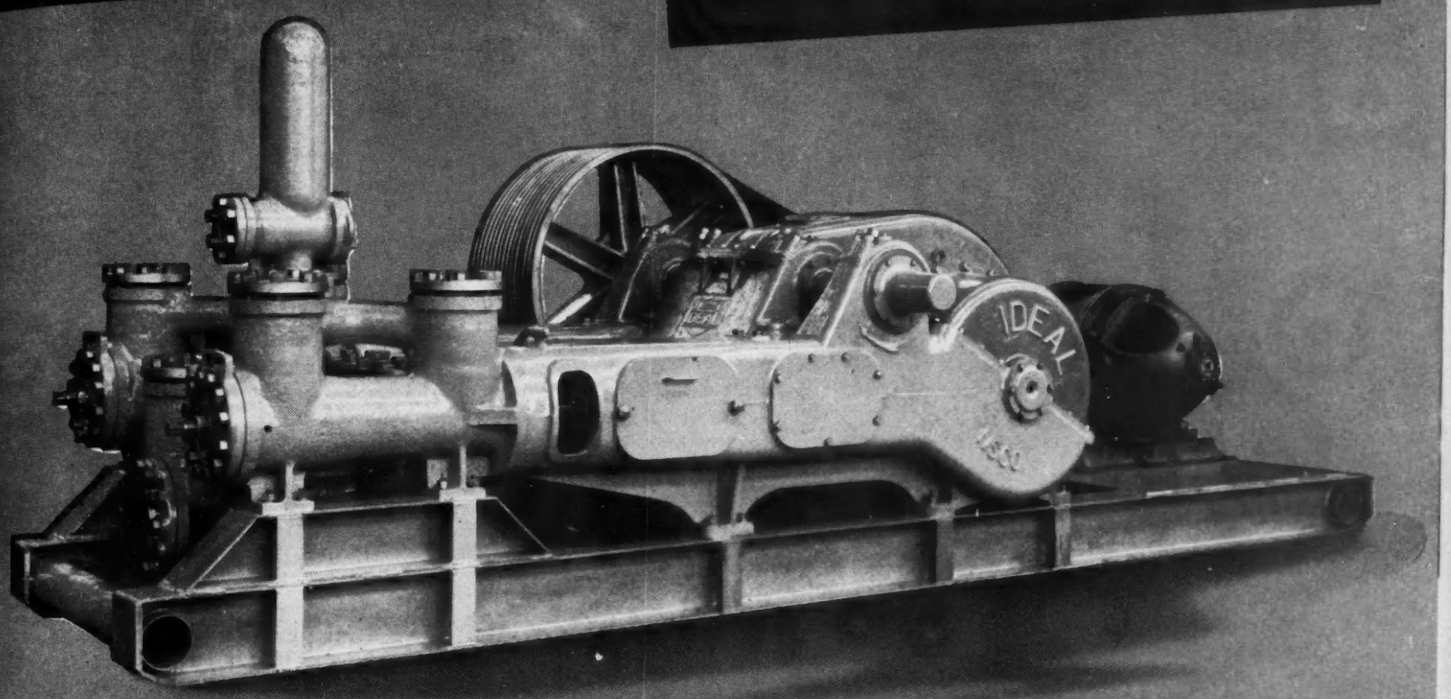

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C-150	6¾"	12	2,000	550	65	150	17,000
C-250	7¼"	15	2,500	710	60	250	28,975
C-350	7¾"	18	3,000	800	55	350	36,400

IDEAL TYPE "C" Power Driven Slush Pumps are designed especially for continuous operation at higher speeds, and are consequently able to deliver an equal or greater amount of fluid than longer stroke, slower speed, power pumps of apparently larger capacity.

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sions. It is hard to judge the relative importance of these structures as reservoirs of oil, but it can be seen readily that domal structures occur most commonly in the Gulf Coast while sand lensing predominates in the South Texas area. Endless combinations of these various structures occur too, but no attempt is made to point out while referring to the accompanying tables in which cases these combinations are found.

Such well-known fields as Flour Bluff, Nueces County, and Corpus Christi, Nueces County, have anticlinal structures. In East Texas productive anticlines are found chiefly in the Corsicana field of Navarro County and in the Rodessa field of Cass and Marion counties. In the Gulf Coast anticlinal structures are comparatively rare and domal structures predominate. Many of the world's greatest oil fields have been found in anticlines and this structure is popular in that it seldom proves unproductive.

In close association with the anticline is the dome. There is a predominance of salt domes occurring in the Gulf Coast and some typical salt dome fields may be cited as follows: Conroe, Montgomery County; Esperson Dome, Liberty County; and Hankamer, Liberty County.

Monoclines are not very often found to be productive structures in the Mesozoic and Cenozoic oil producing fields of Texas. There are only six monoclines found to be productive structures in all three districts under consideration.

Faults are outstanding in Texas production. The Balcones fault is responsible for such fields as Luling, Caldwell County, and Darst Creek, Guadalupe County. Production in Navarro and Limestone counties is due entirely to the Mexia fault. Such fields as Mexia, Limestone County, and Currie, Navarro County, are found in the Mexia fault district.

Sand lensing is the outstanding structure occurring in the South Texas oil fields. Prominent among these South Texas fields are: Government Wells, Duval County; Mirando Valley, Zapata County; and Tuleta, Bee County. Sand-lensing accompanied by faulting occurs quite frequently in South Texas in fields such as Mirando Valley, Zapata County; Ray, Bee County; Saxet, Nueces County; and Seven Sisters, Duval County.

Terracing is of very minor importance and occurs only twice as productive structures in the oil fields under consideration in this paper. Noses are also of minute importance as oil producing structures.

In South Texas, eight fields have been found to be associated with igneous intrusions. The igneous rocks seem to have been responsible for the development of folds into which the oil has migrated from nearby sedimentary formations. Such deposits are rare. Igneous production occurs from buried serpentine plugs which are found intruded in the upper Austin chalk and basal Taylor. Oil has been obtained from the crests and flanks of these plugs. These igneous intrusions seem to be associated with the Balcones fault and are most prevalent in Bastrop, Travis, Williamson, and Medina counties. Notable among the productive fields from this type of structure are: Thrall, Williamson County; Lytton Springs, Caldwell County; Kimbro and Manda, Travis County; and Dale, Caldwell County.

A summary of productiveness of types of structure according to fields is given in Table 2.

TABLE 2

Summary of Productiveness of Types of Structures According to Fields

	East Texas	Gulf Coast	South Texas	Total
Anticline	5	3	22	30
Dome	8	77	33	118
Fault	14	7	88	109
Sand Lens	3	..	103	106
Nose	..	3	8	11
Monocline	2	..	3	5
Igneous Plug	..	..	9	9
Terrace	..	2	..	2

Nature of Producing Horizons

Besides structures favorable to oil accumulation, consideration must also be taken of the accompanying types of rocks prevailing as oil reservoirs.

It is understood that any rock having a sufficiently high porosity may serve as the reservoir rock. Sand, therefore, is the most prevalent producer. Other rocks proving productive in the fields of the areas under discussion in this paper are: limestone, shale, and porous altered igneous rocks.

A requisite of a reservoir rock is that the openings be connected with each other in order to permit the free entrance and exit of oil. Therefore, it is readily seen that sandstone and sand would be the most common of oil reservoir rocks with their large range of texture and porosity. Limestone makes an excellent reservoir where it is fissured.

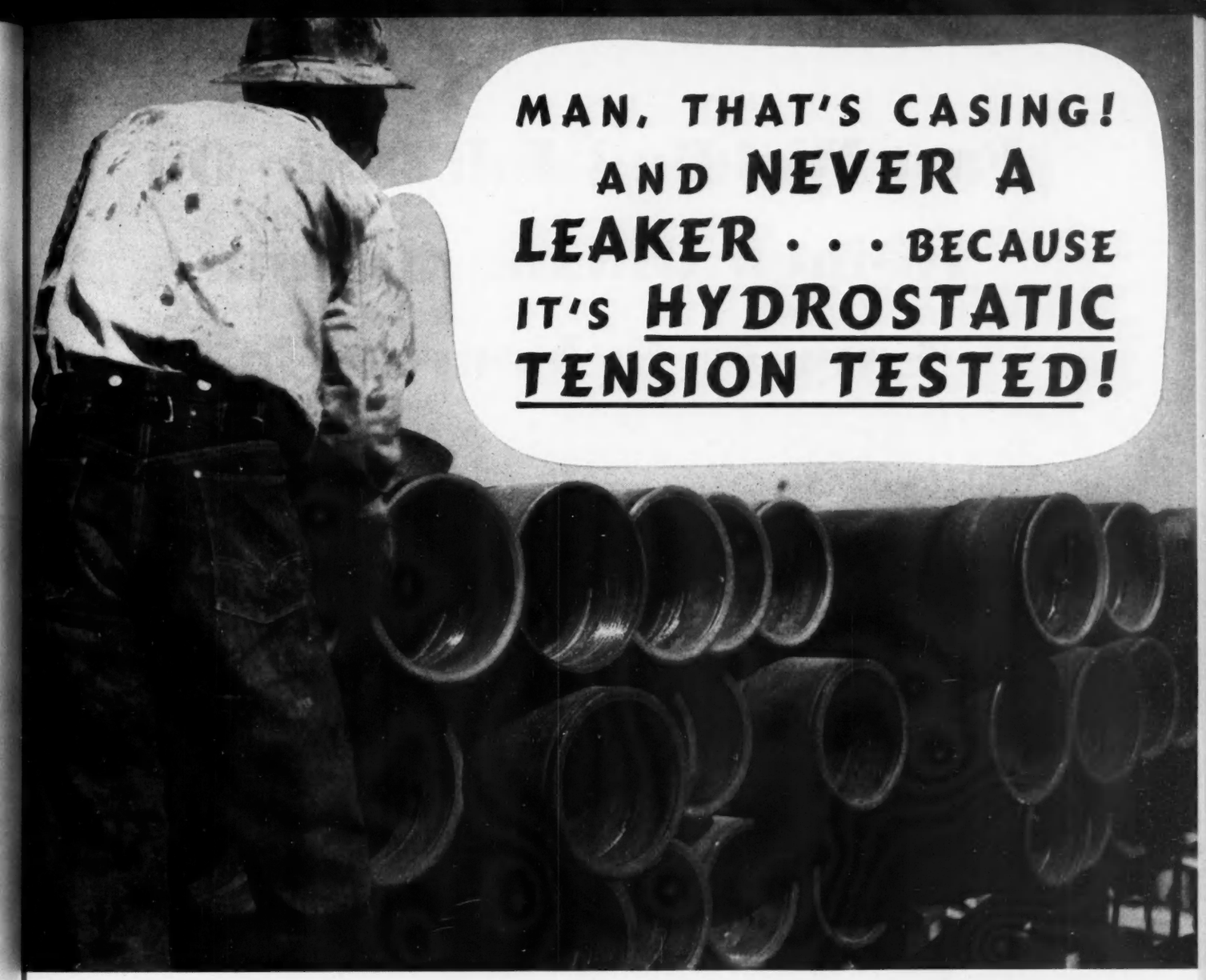
No attempt is made here to deal with the specific and relative characteristics of these rocks. A summary of productiveness according to lithology is given in Table 4.

The oil fields producing from each formation have been listed opposite the corresponding formation on Figure 3. Every producing horizon of each field has been listed including oil and gas producing horizons. Therefore repetition in the names of fields indicates different producing horizons of these fields. Fields producing from a formation designated as "general" are those on which information could not be obtained as to the exact producing horizon within the formation. The term "general" indicates that production may occur anywhere within that formation. When the name of a field is followed by a question mark it means that production from that horizon under which it is listed is probable but is questionable.

TABLE 4

Summary of Productiveness According to Lithology

	East Texas	Gulf Coast	South Texas	Total
Sand	21	85	143	249
Limestone	7	..	20	27
Serpentine	..	..	12	12
Cap Rock	..	10	1	11
Shale	..	..	8	8



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Fast Welding Job Done On 16-inch Oficina-Guanta Carrier in Venezuela

RECENT completion in Venezuela of the welding phase of Mene Grande Oil Company's 102-mile-16-inch oil line from Oficina to Guanta on the Caribbean seaboard in 90 days is a tribute to modern pipe line laying methods and equipment.

One of the several factors responsible for the speed with which this line was put down was employment of the "firing line" procedure on applying the arc welds, making it possible to complete in one instance 9 miles of line in a day. Moreover, completion of 12,192 joints in 90 days indicates an average of 135 joints were welded complete each day. This was done with one "firing line" gang and two tie-in gangs.

Before explaining the application of the "firing line" method as used on the Oficina-Guanta line it should be noted that all of the pipe was 3/8-inch thick, with the exception of 70,000 feet, which was 0.4-inch thick.

Completion of the line from Oficina to Guanta has changed the ranking of Eastern Venezuela as a market factor. When 1938 closed, Eastern Venezuela's daily production of around 85,000 barrels represented less than one sixth of the nation's output. With the first tanker scheduled to be loaded early in October at Guanta the difference in importance of the two areas from a production standpoint will become less.

While the main contract for the line went to Williams Brothers Corporation and S. D. Betchell Company, both of the United States of America, the sub-contract on the welding went to H. C. Price Company, also of the United States.

The "firing line," as employed by the Price organization on the Mene Grande line, consisted of two tack welders and four finish welders. The combined tie-in gang consist-

—Photos Courtesy Lincoln Electric Company

This is the crew that turned in remarkably fast time in welding 102 miles of the 16-inch line in Venezuela from Oficina to Guanta in 90 days.

Illustration shows **GASO PUMP AND BURNER MFG. CO.'s** 7x12 Duplex Power Pump. This is their largest and newest design. It uses Hyatt Hy-Load Bearings as standard on both ends of pinion shaft.

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HYATT ROLLER BEARINGS

American welding crew making a tie-in weld on Mene Grande Oil Company's new Venezuelan line.

ed of two tackers and four welders. Plain butt joints, without backing-up rings, were used.

In the "firing line" procedure, the line up and tacking crew preceded the entire construction gang. Aided by a tractor and hoist, they put the pipe lengths on ball bearing dollies for rolling. The tack-welder tacked the adjacent ends of pipe together, usually at four points in the circumference. He joined as many lengths as the nature of the line and the contour of Eastern Venezuela would permit. A long tack-welded section was then left on the dolly ready for the "firing line" welders who followed close behind.

The "firing line" crew completed the welds of the long section. These operators welded at the top of the pipe while a helper turned the pipe by means of a chain pipe wrench. Thus, all welding was done in a flat, down-hand position.

High welding speeds were obtained by using large size electrodes and heavy welding current. On the Mene Grande line 3/16-inch electrodes were used for the first, or stringer, bead, ¼-inch for the second bead, and 5/16-inch for the third bead. After completion of each bead, a helper cleaned all the slag from the weld. Each completed weld was inspected for any imperfections before the welders proceeded with the next joint. When a section was entirely welded, (there were 9304 of these "firing line" welds), the pipe was rolled off the dollies and the pipe sections were painted and then joined into a continuous stretch by "bell-hole" welding. There were 2888 "bell-hole" welds on the line.

For the "bell-hole" welding the pipe was placed on timber skids near or over the trench. In this case, instead of having the pipe rolled beneath the arc the operator plied the arc around the pipe.

Engine driven arc welding machines of modern design were used on the job affording Oficina with a 16-inch outlet.

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WORLD DEVELOPMENT and TECHNOLOGY

Edited by
WM. V. GROSS, Associate Editor

Oil and War

Polish conquest gives Germany additional crude oil reserves . . . Rumanian fields may be next objective

Following conquest of Poland, Germany and Russia now have available for diversion to military purposes all of the aggregate 213,748,000 barrels annual production except that needed to carry on domestically in time of war. Capture of Poland represented an annual production of 3,827,000 barrels of the above total.

Domestic production of the allies can not approach the above figures remotely, and England and France must depend almost entirely on imports of crude as well as refined production to carry on war-time activities. Germany and Russia, on the other hand, are said to be woefully lacking in certain grades of lubricants and gasoline.

Allies Sources Better

Import potentialities of the two sides may be summed up as follows: England and France have the reputation of being on friendly terms with greater crude and refined petroleum sources than Germany and Russia. Ostensibly they have more sources to draw on. But late developments have made dopesters reticent to accept the obvious.

It is generally conceded that the 58,000,000 barrels annual production of Rumania may be the next objective of German diplomacy or fighting forces, despite any existing treaties. Germany, as a matter of record, has been applying pressure to get Rumania to increase export shipments of crude and refined petroleum to her, but has been stymied temporarily by Rumania's declaration that she cannot do so without disregarding "collateral royalty," so to speak, held by French, English and American interests. Rumania has producing and refining facilities highly desired by both sides of the belligerents.

Soviet Ability Unknown

Russia's production of slightly over 18,000,000 barrels in July allowed that country to maintain second place in world production, with Venezuela crowding for that rank, but, as has been pointed out in this publication previously, her production increase is at a far less rapid rate than is her increase in domestic consumption. Whether the Soviets can step up production appreciably for war needs is a matter for speculation, but, as has been brought out by G. D. Hobson of the Imperial College of Science and Technology in London, in spite of their search for oil in many parts of that large country, the Caucasian region is still the controlling factor in Soviet production. Moreover, the inference has been made repeatedly that Russia is sadly deficient in producing war-time needs of high-grade lubricants and aviation gasoline suitable for combat purposes.

Opinions Differ

Some claim that if American neutrality legislation and Mexican recalcitrance impede supplies of petroleum from England's obvious sources, then Venezuela's output alone would be more than sufficient to take care of British needs, while Colombia and Peru could be counted on to contribute. Others point out that this may be true in a sense, but that it does not answer England's greatest need, which is for lubricants and gasoline.

Venezuela does not have enough of the right types of refining capacity to alter the situation. Trinidad, with all her production and refining capacity can only supply a fraction of the needs. All crude and refined exports of Colombia and Peru have for years been absorbed by peacetime markets, leaving little available in the way of surplus exportable products to meet the demands of war.

May Need U. S.

Hence, it would seem that the problem would resolve itself into one somewhat similar to that existing in 1918 when, according to J. Howard Pew, head of Sun Oil Company, the United States shipped 2,600,000 tons of fuel oil and 1,000,000 tons of distillate to Europe. It might also be pointed out in this connection that in the final drive of the allies in the last world war more than 80 percent of the oil used came from the United States.

England is not lacking in tankers for transportation of crude from any source, for as far back as midnight of August 26 she foresaw some of the contingencies that have arisen. At that hour the British admiralty assumed control of all British merchant shipping, including British tankers. British naval authorities took the right to give those tankers any directions deemed necessary, including changes of courses.

Regarding rumors that tankers of Standard Oil Company of New Jersey under British registry, which would include a large percentage of Jersey tankers in international service, had been taken over by the British government for duration of the war, E. B. Lyman, executive of the corporation, wired THE OIL WEEKLY September 29: "Have no information regarding reported British government's action taking over Jersey tankers."

There was, moreover, reported a material tightening of the tanker situation within the past two weeks as the result of the European war. Rumors persisted of creation of an international insurance on tankers, owners of tankers not under register of warring nations having pooled their insurance to any liabilities.

While denial of formation of the insurance pool was not obtained, Lyman telegraphed: "Our marine people say insurance rates on ocean tankers have gone down since the start of war. They do not believe creation of an insurance pool feasible or necessary in view of the fact that American tankers are not traveling to war zones."

Alberta issues new map of natural resources

Alberta's Department of Lands and Mines last week anounced publication of a new natural resources map and half-year review of the Alberta oil situation. They are being made available at no cost to all interested, and can be obtained from the technical division of the department at Edmonton.

The map shows surface areas, surface resources, mineral areas, mineral resources, airways, railways, surfaced and improved earth highways, irrigation canals, bird sanctuaries and Indian reserves. Game, fish and fur areas are also shown, and the location of coal, oil, natural gas, timber, salt, bituminous metals, water power and other resources are indicated.

Petromex completes well on Tehuantepec Isthmus

Petroleos Mexicanos has announced recent completion of El Plan 74 on the Isthmus of Tehuantepec for 1580 barrels daily. The well was completed on properties formerly operated by Mexican Eagle Oil Company.

Barco Oil to Market

South American Gulf to start running crude through line October 21 . . . To double Colombia's production

Completion of one of the greatest pipe line projects in the world, South American Gulf Oil Company's 12-inch, 240-mile line from the Barco concession in eastern Colombia over unusual natural hazards to tidewater at Covenas, will be celebrated with ceremonies surrounding loading of the first tanker at the latter place about October 21.

Actual laying of the line and construction of 3 booster stations have been finished, and the time during the next three weeks will be consumed in last-minute preparations and inspections to be sure everything will function properly when the president of Colombia dignifies the opening of the line by taking a part in the ceremonies.

Scrapers are being run through the line as this is written to see that nothing will interfere with operation of a carrier expected to double the amount of production Colombia contributes to to world markets.

The 12-inch line is expected to handle in excess of 60,000 barrels of Barco concession crude per day, an amount equivalent to that which Colombia was credited with producing daily during 1938 from the DeMares concession, operated by Tropical Oil Company, which has a terminal and refinery at Cartagena.

Shut-in production on the Barco concession early in February, 1938, was estimated at 14,000 barrels daily. This estimate was arrived at just about the time Colombia Petroleum Company announced intentions of drilling around 50 wells on the concession during 1938. Weather conditions, principally floods, retarded this program to a certain extent, but not enough to keep the company from adding an estimated 58,000 barrels of initial production during the year. These 72,000 barrels per day, coupled with the added initial production of completions on the Barco since the year began, assure the line of sufficient production. It probably is safe to assume at least 100 wells have been completed in the Barco concession thus far.

It is not unlikely that other production developed in the Magdalena Valley of Colombia will be carried through the line before other carriers to tidewater are put down. Shell Oil Company, Socony-Vacuum interests and other important oil organizations have been wildcatting on large concessions in the Magdalena River valley in localities fairly close to the route of the line, and it is logical to assume they would like to tie into the carrier rather than spend the amount of money necessary to construct a similar one for their own production until it had assumed justifying proportions.

Covenas, the tidewater terminal of the South American Gulf Oil Company's line, is an ideal one. Tankers can load at a pier rather than by means of a sea loading line. The spot is one chosen nearly a generation ago by the Cudahy packing people as a point from which to export meat to the United States. The bay on which Covenas is located is fairly well protected.

The man with his back to the camera is Oscar Wolfe, assistant general manager of South American Gulf Oil Company who is inspecting the wharf at Covenas, Colombia. The one in puttees is Otto Burkhardt, who went to Colombia in 1915. He was in charge of construction at Covenas terminal.

Harvest demands boost Turner Valley allowable

The Alberta Petroleum & Natural Gas Conservation Board last week increased the allowable of crude oil wells in the Turner Valley field from 22,000 to 23,000 barrels daily. The increase was occasioned by a heavy demand for oil during harvesting operations in Western Canada.

The new order of individual well allowables lists Home Oil Company's Millarville 2, which last year extended the crude oil area 15 miles north, as the field's largest well, carrying an allowable of 716 barrels daily. Next largest producer is Royal Canadian Oil Company's No. 2, with an allowable of 545 barrels.

The Alberta Petroleum Association last week asked a government subsidy on crude oil freight rates to extend eastward the market for Alberta crude, a move that it is believed would result in a continued heavy drilling program throughout the winter months.

"Operators generally believe that if the dominion government could be persuaded to subsidize freight rates from Manitoba to Ontario and Quebec, the cost of the subsidy would be justified, as many thousands of dollars in exchange paid out in purchasing American funds to buy American crude would be saved," the association said. "Many sources would benefit. Coal would be used to move the oil trains. Railway shops would be given more work. Train crews would be employed in the off season. The move would prevent thousands upon thousands of dollars from being added to the United States trade balance with Canada at a time when Canadian money should be kept in this country."

A generation ago the Cudahy packing people saw the possibilities of the Colombian port of Covenas as a point from which to export beef. This airplane view shows the old buildings of the packers which were taken over to serve as temporary headquarters for the tidewater terminal of the South American Gulf Oil Company's 12-inch line from the Barco concession. The picture was taken by an Oil Weekly staff man during a recent trip to South America.

MEN IN THE INDUSTRY'S NEWS

OSCAR C. SCHORP of Standard Oil Company of New Jersey with offices at New York, has been made vice president and manager of the production department for Carter Oil Company, Tulsa, succeeding F. W. Floyd, who was transferred to Caracas, Venezuela. Schorp started with Standard Oil Company in 1920 at Tampico, Mexico, and then moved to Cartegena, Colombia, to be later transferred to Maracaibo, Venezuela, where he remained for 5 years. Schorp has been at the New York offices since late 1934.

MALVIN HOFFMAN, chief geologist for Midco Oil Corporation, Tulsa, spoke before the Shawnee Geological Society, Monday, September 25, on "The Role of Isostacy in Mountain Building."

FRED WARDEN, formerly in the accounting department of Sunray Oil Company, Tulsa, since 1932, has joined the accounting staff of Tulsa Oil Corporation.

DON W. JOSEY and Clint W. Josey, owners of the Rancho and Gem Oil Companies, Dallas, and Monroe H. Goode, independent operator, launched a general offensive against New Mexico's bear, lion and antelope legions last week. The Josey brothers will try their luck at roping the "man-eating-lions" and bring 'em back alive. For several weeks they have spent their spare time with the lariat to perfect their roping technique. Goode, seasoned big game hunter, will back up the roper with a high-powered rifle—just in case. Goode will also serve as staff photographer and historian of the expedition. Upon departure, Goode expressed every confidence in the ability of his companions to rope "anything that walks, runs, or flies," but stated he hoped they would develop some defensive tactics of their own, such as sprinting, flying or broad jumping.

JOHN ROBERTS, drilling superintendent for Caribbean Petroleum Company at Maracaibo, Venezuela, recently was elected the first honorary member of the Houston chapter of Nomads.

J. H. HESTERLY, assistant land department manager for Shell Oil Company at Houston, is back at his desk after an extended leave during which he underwent an operation. During the final days of his convalescence, with Mrs. Hesterly and son, Pitman, he visited old haunts in Arkansas and got in some fishing.

LAWRENCE VANDER LECK, Chairman of the Central Committee of California Oil Producers, returned to his duties last week after 30 days in Idaho.

J. H. PRESSLEY, manager of the land department in the southwest division for Sun Oil Company, Dallas, has recovered sufficiently from 4 months illness to resume work.

AL WINZELER of Stanolind Oil & Gas Company's Kansas geological staff has returned to Wichita after spending several months in the Forest City basin.

T. J. FITCH, retired vice president and general manager of Magnolia Pipe Line Company, and Mrs. Lillian T. Stowe, former employee of the company, were married September 17 in Dallas. They will make their home at Rogers, Arkansas.

R. T. JAMESON, district land agent for Shell Oil Company at Shreveport, has been transferred to Baton Rouge where he succeeds W. E. Scott, resigned. E. J. McLain succeeds Jameson at Shreveport.

ROBERT E. McCONNELL of The Plains, Virginia, former oil man, was appointed business advisor to the Department of Commerce by Secretary Harry L. Hopkins September 27.

McConnell's first assignment was as a representative of the department on the Temporary National Economy Committee, now making an investigation of the oil industry, but his permanent work will be that of attacking, with other advisors of the department, various business problems which may arise or be brought to it by industrialists.

A native of Montrose, Colorado, and a graduate from the School of Mines of Columbia University, McConnell's business and engineering experience has included the exploration for and production of petroleum, service as chemist, engineer and geologist and a directorship in Fohs Oil Company and Pilgrim Exploration Company.

W. C. DAVIS, West Texas district land man for Shell Oil Company, Midland, has returned from Ruston, Louisiana, where he was summoned September 21 by the sudden death of his father.

PAUL RYAN, president of National Refining Company, Cleveland, Ohio, was in Kansas last week looking over the company's operations. He stated his company is planning to enlarge its production, pipe line capacity, and marketing operations in Kansas and Oklahoma.

DAVE AINSWORTH, Wichita geologist, has been named president of the Embassy Club, a social organization for members of the oil fraternity, in Wichita. Other officers are Mrs. Lloyd Pickrell, vice president; Larry Stubbs, district landman for Barnsdall Oil Company, re-elected treasurer, and Ken Bumgarner, land staff of Gulf Oil Corporation, chairman of the membership committee.

SAMUEL J. GUERIN, Texas oil operator, stopped in Evansville, Indiana, last week en route from Europe to his home in Tyler, Texas, for an inspection of recent oil developments in the tri-state area of Indiana, Illinois and Kentucky. He predicted that Hitler, needing oil to carry on a long war, will execute a land-grab in Rumania, and that Rumania will accept Germany's control rather than to offer resistance that might result in a devastating war as in Poland.

DR. W. P. JENNY, consulting geologist and geophysicist of Houston, returned to his office September 27 after spending the summer in the Swiss Alps.

B. D. ROBERTSON, Marine Department, Standard Oil Company of California, San Francisco, has been appointed to the American Petroleum Institute's Special Committee on Water Regulations, D. V. Stroop, chairman, announced recently. The special committee was appointed early in 1939 to consider and recommend changes to the new marine regulations proposed by the Bureau of Marine Inspection and Navigation, of the Department of Commerce. These regulations govern the packing, marking, and transportation of dangerous articles. After frequent meetings the committee submitted its recommendations to the bureau which, it is believed, soon will issue a new draft for reconsideration by shippers and carriers.

ERNEST N. WILSON, vice president in charge of Maracaibo Oil Exploration Corporation's district office at Dallas, Texas, attended the regular meeting of the board of directors held in New York, September 28.

G. R. (BUFFALO) KENNEDY, production scout for Magnolia Pipe Line Company in the East Texas field, has resigned to operate as an independent. He will continue to reside at Tyler. R. L. Denton, statistical clerk in the company's Kilgore office, has been assigned to scouting duty.

BERT L. LIGON, Wichita Falls operator and a substantial stockholder in Wilson Supply Company, has disposed of his interest in the latter concern to devote full time to his extensive properties in the Hull-Silk field, Archer County.

ROBERT LaTOUCHE, geophysicist with Standard Oil Company of New York, died recently in Borneo where he was on duty. LaTouche had been identified with geophysical exploration for several years, working in South Africa, South America, the United States, and the Dutch East Indies. A brother, John LaTouche, is geophysical superintendent for Sun Oil Company with headquarters in Mt. Pleasant, Illinois.

JOHN E. O'CONNELL, 43, West Central Texas operator and a resident of Fort Worth, died September 19 after being ill for more than a year. He was a native of Bradford, Pennsylvania. He was a pipe line scout during the Ranger boom.

WILLIAM L. McCURDY, 40, producer in the East Texas field and a resident of Fort Worth the past 8 years, was fatally injured September 25 in an automobile accident in the latter city. Survivors include a brother, E. J. McCurdy, Jr., Fort Worth oil man.

DREW BEAMS, owner of Beams Drilling and Producing Company, died September 25 in Abilene, Texas. Beams entered the oil business in his youth in the Kentucky fields, and later drilled in India with the Shell interests and in Burma with Burma Oil Company. After several years of company ownership in the Okmulgee, Oklahoma, area he moved to Abilene and devoted his time to development of leases in Callahan County.

THE WEEK'S NEWS SUMMARIZED

Monopoly

The long-heralded investigation of monopoly in the petroleum industry by the Temporary National Economic Committee started in Washington last week. With 30 witnesses scheduled to be heard, it is expected to last longer than two weeks.

First witnesses heard by the group presented contradictory testimony, the industry being charged on one hand with having strong monopolistic tendencies while others asserted such was not the case. Meanwhile, such problems as proration and oil's picture under war conditions also came in for considerable scrutiny.

Those holding the view that the industry constituted an enormous trust governed by the major companies made such contentions as: proration is a price-fixing device, which with pipe line ownership gives the major companies a strangle-hold on the industry; that 20 large integrated companies largely control the industry; that major firms have a formula definitely limiting the growth and existence of independent refiners and producers.

On the other side of the picture were statements that: the control of production while imposing burdens on the producers has advantages that far outweigh any restrictions; that there is complete absence of monopoly, and natural economic laws governing economics are at work, as evidenced by petroleum products being the cheapest of all widely used commodities, and reasonable earnings of the industry.

The anti-trust laws were oked by the Independent Petroleum Association, which listed 15 basic problems of the industry. The group's spokesman stressed the need for authorized voluntary agreements.

Allowables

The outlook for crude control in October is fairly satisfactory, despite liberalizing of allowables.

Seven prominent producing states, which account for about 85 percent of the nation's output, have adopted October allowables 66,833 barrels daily or 2.2 percent under the market demand as estimated by the Bureau of Mines.

Arkansas, California, and Kansas set allowables somewhat above indicated demand; New Mexico and Oklahoma used the bureau figures as their allocations; and Louisiana and Texas propose to stay slightly under the bureau estimates.

In establishing the allowable of 1,360,563 barrels daily for Texas during October, the Texas Railroad Commission announced that all fields, including East Texas, would be shut down for 11 days though the allowable as of September 18 would remain unchanged. Actual production will be about 84,237 barrels below the Bureau of Mines recommendation, it is figured. All fields formerly exempt from the shut down order will be exempt from the new order.

Markets

The industry's markets have remained strong, and prices have continued to advance. A 7-cent crude price increase for fields of southwestern Michigan further enlarged the list of recent local increases, which previously had included raises in several fields of Arkansas, North Louisiana, Oklahoma, and Coastal Texas.

Although refinery prices of products in the Mid-Continent were fairly well settled last week, additional mark-ups by marketers occurred, affecting practically all refined oils.

Particularly strong are lubricants, for which demand exceeds current supply. Prices have advanced 3 to 8 cents a gallon within the past month, having been pushed upward by both domestic and foreign demand. The increased home consumption reflects the expansion of domestic industrial activity, and the larger foreign business is attributed to the prosecution of war in Europe.

Statistics

The statistical situation currently is lopsided. Inventories are mostly conservative, although gasoline stocks are larger than necessary, the markets being bolstered by the limited stocks of crude oil, heating oils, industrial fuels, and lubricants. On the other hand, current operations are at exceptionally high levels, both crude production and refinery runs being near the all-time peaks.

The large crude runs, a natural reaction to the recent oil field shutdowns, have prevented additions to crude storage despite the large output of the wells.

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Oil at the Capitols

Temporary National Economic Committee starts oil monopoly investigation . . . First witnesses give group conflicting views on monopolistic question

Divorcement, conservation to highlight investigation

With more than 30 witnesses scheduled to be called, the Temporary National Economic Committee on September 25 began in Washington, D. C., its long-heralded investigation of monopoly in the petroleum industry, with indications that more than two weeks would be required for the survey.

Leaders from every branch of the oil industry, integrated and independent, are scheduled to parade before the committee, which will hear in detail the charges against the majors.

Full consideration, it was indicated, would be given to the questions of conservation and divorcement, today the two outstanding issues in the industry.

Meanwhile, the oil subcommittee of the House Interstate Commerce Committee, scheduled to begin its own investigation of the industry as a preliminary to consideration of the Administration's conservation-control bill, agreed to postpone its survey until the conclusion of the Temporary National Economic Committee inquiry, apparently believing that the monopoly committee would cover some of the fields it had slated for consideration and desiring to avoid duplication of effort.

Opening the hearing, Senator Joseph C. O'Mahoney of Wyoming, chairman, explained that, in distinction from previous investigations, which had been worked up by committee staff members, the oil inquiry had been developed by members of the industry itself.

Outlining the purposes of the study—to determine the effect of the existing price system and price policies upon the general level of trade, employment, long-term profits and consumption, Chairman O'Mahoney asserted that "the importance of the task is only emphasized, it is not minimized, by the international situation."

"The European war," he said, "itself is one result of the failure to find economic security in the old world and it must be clear that the outbreak of the conflict there only makes more necessary our own determination to learn the facts which lie at the root of the economic problem.

"The task of the committee becomes more important, if that were possible, as a result of the conflict in Europe. Already fears of profiteering have been expressed. That artificial and unjustified increases of prices makes more difficult the task of economic readjustment is, of course, apparent to all. Profiteering in time of war accentuates the evil effect of price exploitation in time of peace and those who give way to the temptation to sieze a quick profit at the expense of the consumer by raising prices when costs have not increased make the problem worse than it need be."

Adviser Charges Monopoly

The view of the industry taken by the TNEC staff was outlined by its economic adviser, Dr. John Ise of the University of Kansas, who declared that the oil industry really is a "succession of industries," that integration has to some extent been forced upon it, and that elements of monopoly exist in every branch.

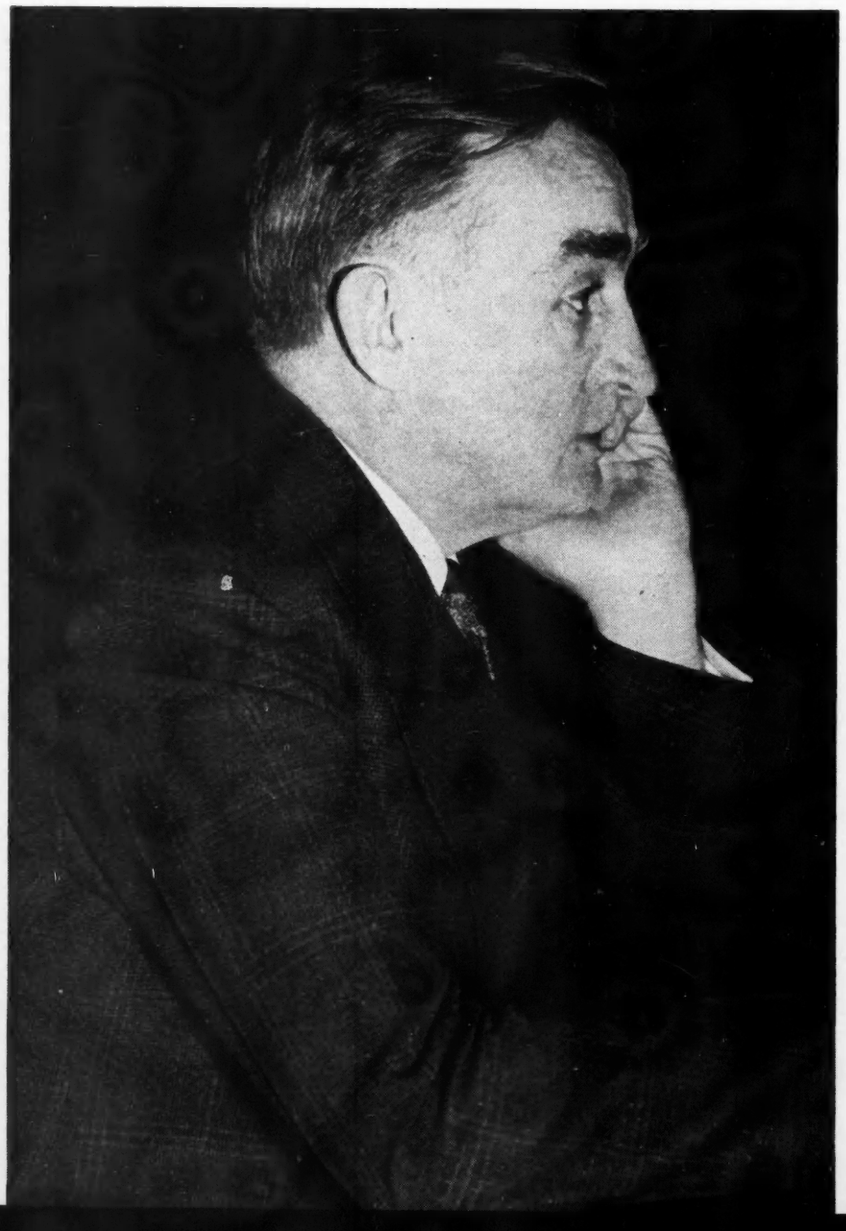
The industry last year, Dr. Ise said, produced approximately 1,250,000,000 barrels of oil from 350,000 wells, transported it to refineries through 115,000 miles of pipe lines and by a fleet of several hundred tankers, refined more than 550,000,000 barrels of gasoline which was transported to consuming centers through 6640 miles of pipe lines and by thousands of tank cars, and marketed its products through 27,000 terminals and bulk plants, nearly 200,000 service stations and almost as many other establishments selling oil products.

However, he said, figures of investment and operation do not picture adequately the economic significance of the industry, whose operations have revolutionized the whole economy of the world and even methods of warfare.

Peculiarities of the industry, Dr. Ise pointed out, include its dependence on an exhaustive resource, whose extent and duration are not known, and the fact that supply comes largely from pools underlying land owned by many surface owners and the "rule of capture" which was responsible for the frenzied haste and great waste which marked production until recently.

The greatest peculiarity, however, he continued, is that it is "really a succession of industries, integrally related in production of crude oil, transportation, refining and marketing."

"Most of the oil business is done by large, integrated companies, which perform all the functions from derrick to service station," he told the committee. "There are, it is true, some independent producers, refiners and marketers,



SENATOR JOSEPH O'MAHONEY

Importance of finding roots of economic problems are emphasized by European war.

—Harris & Ewing photo

but they do only a small proportion of the total business, and they operate under very serious difficulties, in competition with the great integrated companies. It is for that reason, indeed, that integration has really been forced upon those in the industry. With integration has gone the growth of very large business units, units larger than are found in most fields of American industry.

"In some of its departments, the oil industry clearly does not fit the pattern of competitive business. In various respects the industry presents a picture suggestive of monopoly. In the first place, the oil business is largely in the hands of 20 large integrated companies. In 1938, the investment of the 20 major companies was slightly in excess of $8,000,000,000, of a total of between $11,000,000,000 and $14,000,000,000 — or roughly two-thirds of the total."

The 20 companies, Dr. Ise said were the Consolidated Oil Corporation, Standard Oil Company of New Jersey, Standard Oil Company of Indiana, The Texas Corporation, Gulf Oil Corporation, Socony-Vacuum Oil Company, Ohio Oil Company, Shell Union Oil Corporation, Tide Water Associated Oil Company, Cities Service Oil Company, Continental Oil Company, Phillips Petroleum Company, The Atlantic Refining Company, The Pure Oil Company, Standard Oil Company of Ohio, Skelly Oil Company, Sun Oil Company and Standard Oil Company of California.

"The dominant position of the 20 major companies does not of course preclude the possibility of fairly vigorous competition among them, yet certain factors tend to establish a possibility of cooperation," he said. "In the first place, some of these companies are interrelated through common stock ownership, and through the joint ownership of operating subsidiaries and affiliates. As an instance of this, the outstanding stock of the Great Lakes Pipe Line Company is owned by eight large oil companies, all of them included among the 20 major units. If these companies should cooperate in their use of the pipe line, they might easily cooperate in other activities as well. In the second place, some of these companies are interrelated through stock holdings in patent companies; and in the third place, the officers of these companies, like the officers of most large corporations, control the voting of the stocks so completely that they need not consider stockholder approval of their acts and policies.

"The relative importance of the 20 major companies has apparently grown appreciably in the past decade or more. Between 1926 and 1937, their percentage of the stocks of crude petroleum and principal petroleum products rose from 76.6 to 94.2, their percentage of refining capacity rose from 65.5 to 75.6, and their percentage of the total gasoline production rose from 71.3 to 83.8. Their position in the industry appears to be growing stronger."

The moderate earnings of these major companies, averaging 8.9 percent on the par value of their common stock, or 5.6 percent of its book value for the years 1924 to 1938, do not suggest a strong monopoly control, Dr. Ise admitted, but, he said, "it is significant that these companies earned their profits largely in the departments or functions in which a monopoly position is most clearly indicated". Earnings in the pipe line departments were "princely", in the refining departments "high", and in the producing departments "fairly high", while the marketing departments, where competition is severe, considerable net losses were suffered.

"Regardless of possible cooperative action among the major companies there are various monopoly elements in the industry," he went on. "While in the market for products, the major companies compete among themselves, and with independent companies, at other points they are in a position more or less monopolistic. Patents are essentially monopolies, granted and protected by the government. In the buying of crude oil from a given field, there are seldom enough buyers to suggest a competitive market, and there may be only one — the pipe line running from the field, or a buying agency allied with it. Such a market situation is what economists call 'monopsony'— monopoly on the buying side."

Pipe lines, somewhat like railroads and other carriers, are generally in a monopolistic position with respect to producers, and may properly be regarded as natural monopolies, he told the committee. Through their integration with pipe line companies, and in other ways, the refiners are in a position monopolistic to some extent; in the marketing of their products, they must meet competition of other refiners, but in the purchase of their crude, they are often in a position more or less monopolistic.

"The marketing of oil products is in some respects highly competitive," Dr. Ise said, "yet in other respects it shows distinct elements of monopoly. There is some price cutting by independent stations, but the general picture is one of uniform prices set by some dominating company and followed by most of the others — price leadership. Competition is so severe that the marketing business is carried on at a general loss, but the competition appears, not in terms of price, but in terms of an aggressive campaign for gallonage, with heavy emphasis on service and advertising.

"It may be noted, finally, that competition between the major integrated companies, on the one hand, and independent producers or refiners, on the other, is not such as would be found in a genuinely competitive market. In a sense, the integrated companies and the independents are in different businesses."

THE JURY

Members of the Temporary National Economic Committee attending the opening session of the oil investigation were as follows:

Senator Joseph C. O'Mahoney (Dem., Wyo.), Chairman.

Thurman W. Arnold, Assistant Attorney General, representing the Department of Justice.

Representative Clyde Williams (Rep., Mo.).

Isadore Lubin, representing the Department of Labor.

Joseph J. O'Connell, Jr., representing the Treasury Department.

Willis Ballenger, representing the Federal Trade Commission.

Clarence Avildson, representing the Department of Commerce.

R. E. McConnell, representing the Department of Commerce.

Representative Hatton Sumners (Dem., Texas).

Cole subcommittee defers action on control study

Members of the Cole subcommittee of the House Interstate Commerce Committee held a brief meeting September 25 to discuss the procedure to be followed in handling the administration's production-control legislation, but decided to take no action until the oil investigation by the Temporary National Economic Committee has been completed.

The subcommittee met to consider suggestions that it might hold hearings of its own coincident with the monopoly hearings, thus saving some of the witnesses from making two trips to Washington. However, it was decided that it would be better to suspend action until after the Temporary National Economic Committee investigation has been concluded, on the possibility that the monopoly survey might develop phases of the situation in which the oil group is interested.

Proration Conserves Supply

The question of conservation through proration and other devices was discussed for the committee by Dr. Joseph E. Pogue, vice president in charge of the Department of Petroleum Economics of the Chase National Bank, New York.

Proration has conserved our oil resources and flattened out the great price fluctuations which formerly marked the industry, he said, but there is no definite information as to whether it has brought the price of oil to higher levels than might otherwise have been reached, although indications are that prices would be higher and reserves lower had conservation not been adopted.

Questioned about the recent general shut-down of production, Dr. Pogue

characterized it as "just an episode" more related to price than to conservation, and explained that the problem in the oil industry is not to prevent high prices to the consumer but to avoid too low a price to the producer.

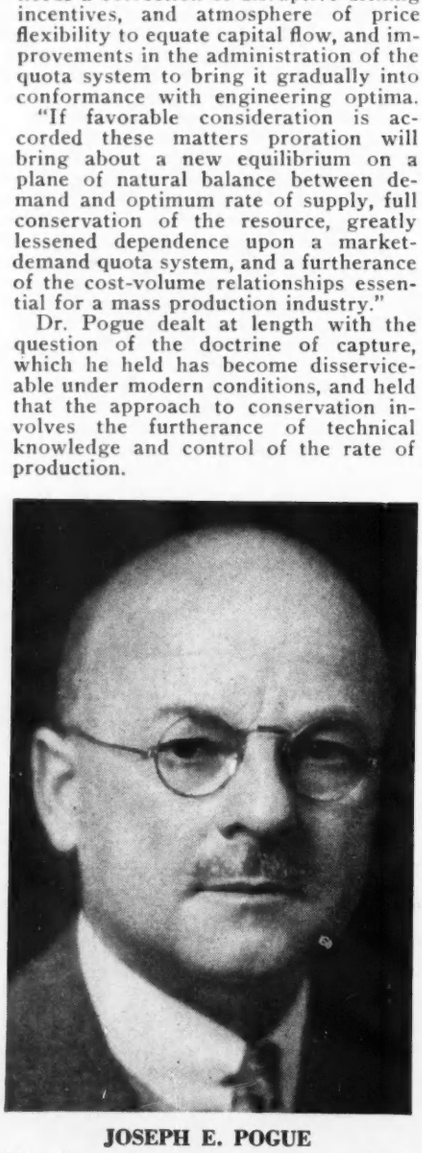
In a 35-page statement filed with the committee, the witness analyzed the proration question, declaring that the eventual economic consequences will be favorable if its evolution follows the present trend toward engineering objectives, but unfavorable if the immediate urge for stabilization through further implementation leads to the development of a rigid system of economic controls under which the vigor and flexibility of the industry will be impaired.

"For a favorable outcome, proration requires a progressive shift in emphasis from endeavors to regulate the economic actions of groups and individuals to efforts to perfect engineering instruments and procedures capable of effectuating optimum recoveries with attendant stabilization," he declared.

"For the present transition period, the existing machinery is adequate, but needs a correction of disruptive drilling incentives, and atmosphere of price flexibility to equate capital flow, and improvements in the administration of the quota system to bring it gradually into conformance with engineering optima.

"If favorable consideration is accorded these matters proration will bring about a new equilibrium on a plane of natural balance between demand and optimum rate of supply, full conservation of the resource, greatly lessened dependence upon a market-demand quota system, and a furtherance of the cost-volume relationships essential for a mass production industry."

Dr. Pogue dealt at length with the question of the doctrine of capture, which he held has become disserviceable under modern conditions, and held that the approach to conservation involves the furtherance of technical knowledge and control of the rate of production.



JOSEPH E. POGUE

The doctrine of capture under modern conditions has become disserviceable.

Control of production, he admitted, will impose burdens upon the producers and other elements in the industry, and must be accompanied by control of imports, but, he held, the advantages it offers far outweigh any restrictions it may impose.

Discussing the effect of proration upon national defense, the witness pointed out that during the World War American oil fields, operating at capacity, had difficulty in meeting the rapidly mounting demand, and it became necessary for the federal government to assume a measure of control and to institute "gasoline-less" Sundays.

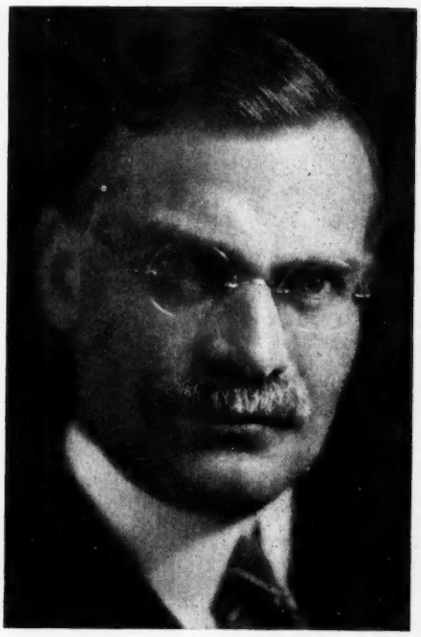
"Under present conditions the producing capacity of our fields is sufficient to turn out a much greater volume of oil than is now demanded and this will be the case so long as the proration-conservation technique is applied to an ample reserve. Thus a surplus of producing capacity is maintained in reserve which could be released in event of national emergency. Proration, therefore, is not only the supporter of potential capacity but in respect to its conservation attributes is creating a larger supply for the future."

The ideal proration, as defined by Dr. Pogue, is a "system of state-enforced engineering quotas keyed to optimum rates of production, as determined by exacting technical investigation, with market demand equated to this quota system by a free and flexible price."

"The full attainment of this end will require time, both to perfect the engineering knowledge necessary to establish the basis for its functioning as well as to permit the gradual accomodation of investments and trade channels to the new plane of equilibrium," he said. "The existing machinery of proration is adapted to this purpose and the employment of market-demand quotas is a necessary instrumentality to effectuate the transition. A concerted move toward the engineering objective, sponsored by the Interstate Oil Compact Commission, coupled with a planned attack by the state regulatory bodies upon the flaws in proration administration that lead to unnecessary drilling, if conducted in an atmosphere of flexible crude oil prices suitable for preserving balance in the internal structure of the industry — these conditions, I believe, would enable the industry to progress to a position of maximum serviceability to both the public and itself.

"As to the future, proration faces two avenues of change. It may evolve either into a rigid system of pervasive regulation under which all freedom of initiative will be throttled, or else into an engineering device for maximizing the resource and minimizing costs, with an effective by-product of economic stabilization. A regimentation in the former direction will come if the system is implemented with further controls under the urge for a quick resolvement of temporary maladjustments; whereas time, technology and economic statesmanship can bring to a successful outcome one of the most significant experiments in the economic field today."

A number of charts showing the results of operation of the industry over the past 10 to 13 years was submitted by Dr. John D. Gill of The Atlantic Refining Company, Philadelphia. The charts, summarizing government and industry statistics, showed the extent



JOHN D. GILL

Prices in the petroleum industry have declined materially under proration.

to which prices have declined since 1926 and other details of operation of the industry.

Howard Pew Testifies

At the opening of the Tuesday session, at which Representative B. Carroll Reece (Democrat, Tennessee) presided, J. Howard Pew, president of the Sun Oil Company, Philadelphia, expounded the views of the organized industry, telling the committee that:

"There is complete absence of monopoly.

"Natural economic laws governing economics are all at work.

"No better illustration of the competitive system exists in American industry.

"Petroleum products are the cheapest commodities of general use.

"The aggregate tax on the industry's activities and products is the highest in the land.

"The industry's average earnings have been and are reasonable.

"Wages are among the highest and employment conditions among the best in the country's industries.

Regulation Not Needed

"No condition exists which requires further federal 'regulation' of the industry's operations.

"The complaints you will hear will be directed, not at monopolistic conditions, but at competitive practices which inhere in any free economy or under any competitive system where competitors exercise free will in the conduct of their business activities."

"The petroleum industry, almost throughout its existence, in one form or another, has been repeatedly subected to searching inquiry," Pew observed. "The spotlight of legislative and judicial investigation, both state and federal, has time and again been flashed into every nook and corner of our activities. There has been much criticism of the industry, much loose talk of it as a monopoly. Most of the criticism has proved, on analysis, to be based on misinformation or prejudice. Largely, it has been directed, not at our industries

system but at competitors and competitive practices; much of it is reminiscent of the old feeling against the ancient 'Standard Oil Trust' which ceased to be a part of the industry almost 30 years ago."

Outlining the history of the industry, the services it renders and the taxes it pays, the witness reminded the committee that "petroleum is our most characteristically American industry."

Because of the European situation, the oil company executive, like many other witnesses, reviewed the importance of the oil industry in war time.

"From the first battle of the Marne, when the taxicabs of Paris hauled a fresh army out to the fighting line in the strategic play that probably turned the tide of battle, to the last sweep of the allies in 1918, petroleum was of first importance," he declared.

"To control oil supplies was the object of much of the war's major strategy. As soon as the United States entered the war the allies made urgent demands for petroleum. Immediately the National Petroleum War Service Committee was formed by leaders of the industry. Through this committee the industry, with very little governmental interference, carried on its war service. Every requirement was met.

"In 1918, 2,600,000 tons of fuel oil were sent to Europe and more than 1,000,000 tons of petroleum distillates. At the war's end the stores of oil in possession of the allies were greater than at any previous time. In their final winning drive, 80 percent of the oil used was from America."

Weapon Against Monopoly

Integration, Pew declared, is a weapon against monopoly.

"The discovery of integration as a bogie man of the industry is of quite recent years," he said.

"If the industry is tainted with monopoly there must be some evidence."

Questioned by Representative Sumners as to charges that the integrated companies carry on their marketing operations at a loss, the witness asserted that, so far as his own company is concerned, marketing has been one of the most profitable, if not the most profitable, departments.

Asked by the Congressman to explain his contention that integration is a guard against monopoly, Pew explained that "an inegrated company having its own production, pipe line facilities, refining and marketing never can be controlled by any one group taking the control of one branch or one activity within the industry." The old Standard Oil trust, he pointed out, was never engaged in either production or marketing but dominated the industry through its control of transportation and refining.

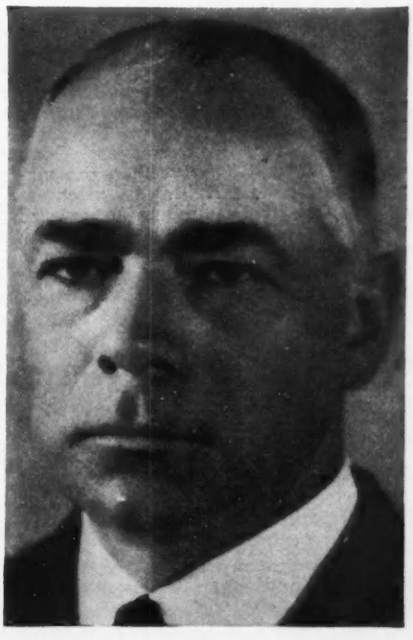
That there is no monopoly in the industry, he added, is demonstrated by the fact that the estimated net book value of all the corporations comprising it is something over $8,000,000,000, and that an estimate of earnings from 1921 to 1936 indicates, for the industry as a whole, a deficit in 1 year and profits in 15, with the highest yearly return on net worth approximately 10 percent and the average for the period just under 6 percent. "It would be a mighty inefficient monopoly that could do no better than that," he commented.

No Need for Changes

"I have outlined the accomplishments of the industry to show that it is serving the public well," he continued. "If I am right, there is no need for drastic changes in governmental policies respecting it. The industry has become what it is under a regime of free enterprise and wide open competition, with little governmental interference. I am convinced that it will give best service in future under a continuance of such conditions. I believe legislation such as has been urged in some quarters would be disastrous to both the industry and the public welfare. I am confident especially that your investigations will lead to the conclusion that neither the industry's record nor the public's welfare justifies any of the punitive measures that prejudiced and ill-advised self-interests have urged on behalf of a small minority."

Pew contended that disintegration of the major companies has been urged by a "few special pleaders" on the ground that it would help one or another of the so-called independents, "yet my very definite information is that 'independents' throughout the industry almost unanimously believe there would be disastrous effects from destruction of the integrated companies."

"The petroleum industry," he explained, "is necessarily an integrated one, whether through common ownership of all the activities or because of contractual relations between the several divisions of the industry. The producer of crude must have a market for it, and must have a transporter to carry it to that market; that is, to the refinery. The refiner, in turn, must have a selling agency to dispose of his products and he must have means of transporting them to that agency. If producer, transporter, refiner and marketer are all owned and operated independently of each other, their common interest brings about what has been called contract integration; they deal with each other through contractual arrangements based on prices, rates, etc. Each activity makes the best bargain it can with the other. That means that every unit of activity in the line from the oil field to the filling station must have its own buying and its own selling organization. This is expensive."



J. HOWARD PEW

It would be a mighty inefficient monopoly that did not earn over 6 percent.

There is a constant quest for improvement of product, Pew testified, citing as an example the research work of his own company.

Disintegration, he said, "proposes to turn the clock back" and would vitiate the economies of mass production, which keeps the price of gasoline lower in the United States than in any other country in the world.

Following the presentation of his statement, Pew was subjected to some four hours of cross-examination by committee counsel and members of the committee, largely devoted to marketing operations and pipe lines.

Under questioning by Hugh Cox of the Department of Justice, who is conducting the interrogation, he testified that Sun Oil Company "spent a great many millions of dollars" in the development of its own cracking process, and expressed the opinion that it would have been cheaper to pay royalties for use of one of the methods already perfected.

Pew was questioned at length regarding his company's contracts with distributors and filling station operators, testifying that Sun has 680 stations, none of which it operates itself.

Testifying that the company does not produce enough oil of its own to meet the requirements of its refineries, the witness was asked by Cox as to the relative cost of produced and purchased oil and said that his organization's production activities were carried on at a loss.

Price Factors

"How do you determine the price you will pay for crude purchased from others?" Cox asked.

"That is very largely a question as to our view of the general competitive situation," Pew responded. "If there is more crude being produced than there is a ready market for, and if as a result of that excess production the price of refined products becomes so low that it is no longer possible to operate the business without suffering heavy losses, we would reduce the price of crude. On the other hand, if the production were not excessive, if there was a great demand for crude oil, if the markets as a result had stiffened greatly and if there was an evident need for encouraging drilling, we would increase the price for crude oil."

"Is there any system of price leadership, so far as the price of crude oil is concerned?" Cox continued.

"I would think that that question might be answered in some such way as this," the witness explained. "The company that has the largest interest in the field and is most affected by competitive conditions is very likely to be the leader in any price change. But if that particular interest failed to change the price when I thought it should be changed, I would take the initiative."

Pew declared that he had done so even when the other company's price was too low, and had posted a higher price.

Would Prefer to Buy

Asked whether it was cheaper to produce or purchase, he said that in some years the company had a loss and in others showed a profit on its production activities, "but on the whole, if I were assured of a constant supply

of the kind of crude I wanted, over a long period of years, I would prefer to buy my crude oil."

He denied, however, that an integrated company producing oil at a cost below the posted price was at a competitive advantage as compared with the independent refiner who must buy all his needs.

Drawn into a discussion of the advantages of pipe line ownership, the Sun executive went flatly on record as believing that pipe line rates should be "reasonable," but held it was within the province of the Interstate Commerce Commission to see that they were so.

Questioned on Line Rates

Pew was questioned extensively along this line by Wendell Berge and Willis Ballenger, representatives on the committee of the Department of Justice and the Federal Trade Commission, respectively, telling the latter that "it is perfectly absurd to establish an unreasonable pipe line rate because it is the total cost of all of our operations which have to do with our profits and our sales policies. Why should we set up a fictitious profit on our pipe line operations? We must keep the pipe line rates reasonable."

Admittedly, he said, the cost of transporting oil by pipe line is lower than that for rail movement. Answering questions by Cox, he said that independent operators have no difficulty in moving oil over major company lines, provided they can provide the minimum shipments, which for his company is 50,000 barrels.

It was pointed out by Ballenger that an argument for divorcement of pipe lines might come to the front eventually and that, if it did, he did not think it should be contended that the pipe lines could not be sold.

The Federal Trade Commission representative on the committee repeatedly harked back to the days of the old Standard Oil Trust, when Standard Oil not only got rebates from the railroads on goods it shipped but also drawbacks on goods shipped by competitors, and attempted to draw an analogy between that and the profits derived by major-owned pipe lines from the oil and gasoline carried for independents.

Ballenger Quits Argument

Pew, however, refused to admit there was any comparison between what had been held by the courts to be an illegal practice and the profits derived from pipe line operation. Briefly, it was Ballenger's contention that the major companies could use their pipe line profits to fight independent competitors in other branches, such as marketing; Pew's that if a company wanted to do that, it could invest its money in some totally unrelated business and use the profits therefrom for that purpose.

Ballenger finally abandoned the argument and released Pew after the latter had spent eight hours on the stand.

Travis Charges Majors Control

An interpretation of the situation diametrically opposed to that of Pew was laid before the committee by Marion M. Travis, formerly general manager of the Southport Petroleum Company, Houston, who charged that the major oil companies "have evolved a formula that definitely limits the growth and the very existence not only of the independent refiner but of the independent producer as well."

Explaining that the major companies sell 85 to 95 percent of their gasoline and kerosene on the "tank wagon market" and the remainder of their products on the "spot market," Travis asserted that the former is definitely controlled by the majors, while the latter is reflected by several trade journals which have no stake or investment in the industry and is so set up that it is not difficult for a broker to manipulate the refined market.

"This manipulation may be the difference between profit and loss to the independent refiner, since the great majority of independent refiners are completely dependent upon these trade jourals for their market realization," he said.

Tells of Market Break

By failing to allow for the decline in business during the 1937 recession, he told the committee, the industry in the last four months of that year and the first three months of 1938 ran approximately 49,000,000 barrels more of crude oil to stills than for the corresponding period in 1936-37, while in the same time gasoline, gas and fuel oil stocks increased approximately 33,000,000 barrels, leading to a situation in which foreign buyers were able to demand and secure concessions which led to the breaking of the market. The inevitable conclusion to be drawn from such practices, he said, is that so long as the industry is geared to produce or refine 15 percent more than we can consume, this 15 percent, which is exported, will in the end set the market for the 85 percent that is sold in the domestic market.

The elements of the "formula" which he charged the major companies followed, Travis explained, include:

1. "Diffused distribution," which renders the independent refiner "almost helpless in his efforts to escape the spot market realization for his refined products."

2. "Tank wagon quotations," which permit the integrated companies to sell their trade-marked brands on their own market structure in a market which fluctuates "usually" only when the majors' business starts falling off after the spot market has been in a protracted decline and independents have been able to make some inroads on the major oil company jobber accounts.

3. "Spot market," in which the independent refiner is helpless.

4. Pipe-line transportation and "the passing on of all or part of the transportation economies effected to the purchaser of the commodity transported in order to destroy competition."

5. Export spot market for crude, a ramification of the export refined spot market.

6. Tetraethyl lead, until recently a "powerful economic club."

7. The American Petroleum Institute, "dominated and controlled by major oil companies."

8. "Political pull, power and influence." "There is not a state in the Union which has not felt this subversive influence in some way or another," he declared.

Cross-examined by Watson Snyder, Department of Justice attorney, on Thursday, Travis declared that many of the oil-buying companies failed to adhere to their posted price, plus transportation, loading and gathering tariff, and that it was possible for refiners to secure concessions.

This, he said, was not "ethical," eliciting from Leon Henderson, a member of the committee, the inquiry whether it was ethical for a refiner to buy at such concessions.

"Business is competitive," the witness replied. "If you have to have crude you usually buy at the best price obtainable, but the practice of making concessions from the posted price, with transportation, loading and gathering tariff, leads to a breakdown of the entire structure.

"The whole theory of proration," he continued, "is based on the idea of balancing supply against demand. I think it is for that reason that crude-oil purchasers infer that they have the right to post fixed prices for crude because there is so much demand and so much supply, and I think it is incumbent upon those purchasing companies to maintain the price structure in relation ship to their posting."

However, he declared, when wells in the East Texas field capable of producing 1000 barrels or more a day are kept down to 20 barrels, proration loses its conservation aspects and becomes a means of supporting prices.

Travis made it clear that not all the major companies retreat from their posted prices, and in discussing refiners' sales, said that some companies are eminently fair, specifying Standard Oil Company of New Jersey as always buying at the market or better, while Asiatic Petroleum Company, probably the largest buyer on the Gulf Coast for export business, he charged, always buys Diesel oil at the heating oil rate. In many instances, he asserted, buyers for the foreign market are able to get products at less than cost.

However, he said, the European markets have been greatly reduced in the past two years because the dictator countries have been buying on a barter basis from Rumania and other countries.

Under questioning by Synder, the witness said he had attempted to induce the American Petroleum Institute to change its system of statistical reporting and last November read a paper at the Chicago meeting of the association.

Old Ocean Enters Testimony

Travis was followed by John B. Dailey, Houston, who submitted a lengthy statement detailing unsuccessful negotiations for the development of a 20-acre tract of land owned by his family in the Old Ocean field in Brazoria County, Texas, and the unavailing efforts to secure a drilling permit from the Texas Railroad Commission, in which he told the committee that a "fundamental issue" in the current situation is whether a land owner can operate as an individual in the center of a great oil field.

"By the constitution of the United States and the constitution of the State of Texas, and the laws of both, it would appear that he could, but whether in fact it is possible is quite another story," he said.

"If a tremendous concentration of economic power can deprive us of our vested rights under the constitution of the United States and that of the State of Texas, then the very roots upon which the foundation of this republic were laid down have been blasted by the 'oligarchy' which apparently rules the State of Texas and may rule the United States."

Under cross-examination, Dailey explained that the interests which controlled the greater part of the oil field opposed the granting of a drilling permit unless his family agreed to pool with another 20 acres which they controlled and bore half the expense of drilling. He charged the major interests with "dictating" the decision of the railroad commission, but withdrew the term when asked to substantiate the allegation by Henderson.

Fell Lists 15 Problems

Fifteen major problems confront the oil industry, the committe was told in a statement prepared by H. B. Fell, executive vice president of the Independent Petroleum Association, and presented for him by Russell B. Brown, general counsel.

"The current interpretation of the anti-trust laws is now handicapping the independent group in their efforts to protect themselves from the large integrated companies," Fell stated. "Since the recent prosecutions, some of the larger companies either fear prosecution if they accept a sound production policy based upon conservation or use the alleged fear of prosecution as a reason for not following such a program.

"The independent elements in the domestic petroleum industry, therefore, insist that provision be made in the law for the authorization of voluntary agrements within the industry subject to the approval of some proper federal agency. Through such agreements the interests of the general public, of the consumer, of the competing elements within the industry, of labor and of all the many other elements concerned should be protected and a sound and practical program for use of this natural resource could be made effective."

The industry could more effectively conserve oil and at the same time make a contribution to other industries if those engaged in the various operations of production, transportation, refining and marketing were able to get together and work out a solution of their problems, he contended.

"If provision can be made for these voluntary agreements within the industry, the wasteful overproduction of petroleum and the wasteful excess refinery runs might be avoided," he argued.

"Through the police power of the states, production can be controlled now but this power is somewhat nullified because it does not extend to refining and marketing. The problem of those two phases of the industry could be met if such voluntary agreements were permitted.

"The problem of oversupply of gasoline which the refiners are facing today and which is of serious moment to the entire industry, might not exist if the industry had been able to get together and make adequate provision for the needs of the country without the wasteful and excessive manufacture of more fuel than will be required currently."

The 15 problems of the industry were outlined by Fell as follows:

1. Pipe-line proration ignores the allocation of state regulatory bodies and assumes for the purchaser the right to determine how much oil will be sold from the separate wells, a usurpation of the state's authority and a violation of the rights of the states and individuals.

2. Tendency on the part of purchasing companies to discontinue the buying of oil from stripper well fields from which they have been purchasing for many years, leaving such fields without an outlet or forcing the producers to sell at less than prevailing market prices to secure an outlet.

3. Selective purchasing, which is the tendency of some purchasing companies to elect the manner in which they will make their purchases in various fields to which they are connected.

4. Correction of price inequities so that a fair and equitable price per barrel for crude would enable producers in a common source of supply and in the same district to receive the same price for the same quality of oil.

5. Establishment of a proper price basis which has as its foundation the cost of production.

6. Lack of oil and gas conservation laws in some of the producing states.

7. Failure of the regulatory bodies in some of the states having conservation laws to enforce them efficiently in such manner as to prevent waste.

8. Unregulated production in all pools in some states and in some fields in other states.

9. The equitable allocation of the total production of each state among the various fields and wells within the state.

10. Lack of any definite restriction of imports which makes it impossible to predict properly, in advance, the portion of the market which will be so supplied.

11. The assurance to each producing state of its fair and equitable portion of the total national production.

12. The drilling of unnecessary wells which constitutes a heavy burden on the industry.

13. The necessity for continuous operation at full capacity of the stripper wells.

14. The assurance of outlets to all producers in such manner that each producer will have his fair and equitable share of the market.

15. The detrimental effect on one branch of the industry resulting from unsound practices in other branches of the industry.

Principles which might be made subject to agreements within the industry, Fell suggested, might include (1) effective utilization of natural reservoir energy in all new fields; (2) prevention of uneconomic above-ground stocks of petroleum and products; (3) assurance of permanent, effective balance of supply with demand; (4) establishment and maintenance of equitable proration, within and between oil pools; (5) elimination of unnecessary and unprofitable drilling; (6) protection of stripper wells; (7) establishment of a proper basis for determining price; (8) elimination of the subsidizing of losses in one branch of an integrated company with the profits from another; (9) establishment of rules making possible sound and ethical practices in the marketing division of the industry, and (10) assurance to the small refiner of access to supply of raw material as well as access to market.

Trust Laws Oked

Following a brief analysis of Fell's statement by Brown, he was interrogated at length regarding the association's recommendations for an interpretation of the anti-trust laws which would permit agreements, explaining that he did not seek any revision of those statutes nor the authority to make any agreements which would be in violation of them, but that many producers were fearful that any attempt to discuss any sort of concerted action, no matter how desirable, might be construed as an evasion of the law.

Rather than have the laws revised, he said, he would drop any of the proposals included in Fell's recommendations.

"It is the thought of most of the producers that the problems of the industry should be corrected within the industry," he said in explanation of the proposal for agreements, adding, in response to a question by Henderson, that the association does not feel that divorce of pipe lines is necessary and pointing out that "we are not sure where we would go for a market under divorce."

Every branch of the industry should stand on its own feet, he said in response to further questioning, suggesting that this might be accomplished, in effect, by requiring separate income tax returns for each branch of an integrated company and the imposition of separate taxes on each division or, as an alternative, that the securities and exchange commission require that companies reporting to them should report separately their income and profit and

Illinois attorneys asked to protect investing public

Following preliminary investigation of alleged abuses in the sale and leasing of oil and gas properties in Southern Illinois by the state securities division, Secretary of State Edward J. Hughes last week advised each of the state's 102 attorneys of the penal provisions of the securities law and requested them to proceed in line with the provisions for protection of the investing public and so that "the orderly progress of Illinois' newest industry may not be unfairly thwarted."

"Within recent weeks this office has conducted an investigation in a number of downstate counties wherein extensive petroleum operations are in progress with a view of determining to what extent the Illinois securities law governing the sale and disposition of oil and gas leases, royalties or deeds, and interests, units or shares in such securities, is being complied with," Hughes said. "The cumulative evidence adduced from a surface examination into the situation in several producing areas clearly indicates a wholesale disregard of the aforementioned act, contrary to the legislative intent of the general assembly and to the sovereign will of the people of Illinois."

loss situation as to each division, which might have the effect of discouraging any temptation to use the profits from one branch to offset losses in another.

Brown was questioned at length as to how the purchasing companies arrive at the prices they post, replying that neither he nor any producer knew exactly how that was done, but pointing out that it left the producer at the mercy of the purchaser.

The colloquy was started by Henderson, who expressed interest in the suggestion for an agreement for establishment of a proper basis for determining price and who, after repeatedly saying the situation was "confusing," wound up his questioning with the assertion that "I am still confused but suspicious."

Forced to Buy Mexican Oil

Eastern State Petroleum Company was forced to undertake the purchase of Mexican oil because of the "stringent domestic situation" which prevailed in the fall of 1938, the committee was told Friday in a statement filed by Louis J. Walsh, vice president of the company.

In oral testimony, Walsh explained that the oil was "unexpropriated" petrolem which is brought in and manufactured under bond for export, and the company does no business within the United States.

Outlining the history of the company, which was formed in 1932 with a capital of $75,000 and now has a network of approximately $500,000, including a modern 15,000-barrel refinery at Houston on which there is an indebtedness, Walsh asserted it ran into one difficulty after another in attempting to compete in eastern markets.

He cited, first, the repudiation of a contract by the terminal company which his concern planned to use, then the "tank steamer pool" of 1932, which placed independents at a rate disadvantage, and then the NRA, which dislocated the industry.

Walsh outlined the operation of the East Texas buying pool, asserting that "the same squeeze play" goes on today, and attacked proration as making new development possible only to the large companies and a price-fixing device which, with pipe line ownership, gives the major companies a stranglehold on the industry.

"All of the 14 independent refineries on the Gulf Coast were dependent on the major oil companies for either supply of crude oil or for outlet for refined products," his statement explained. "Speaking for ourselves, from January, 1938, up to the time of our Mexican contract, sales of gasoline to major companies represented 68 percent of our total sales of this product. One of the reasons that independent refiners are dependent on sales to majors is that the majors, through sales below cost, have taken away the market for free sales on the part of independents. Up to August, 1938, we were at most times so dependent for market outlets definitely,, and at times for supply of crude oil."

Under cross-examination by committee counsel, Walsh said there is "no incentive today in Texas for a producer to invest in new properties" because of the strict proration and Texas producers are investing in other states where proration is less severe. Proration, he declared, "eventually will be harmful to the State of Texas."

Asked for his view on conservation, the witness declared it should be carried out entirely on a basis of engineering principles defining the "optimum" production of individual wells and should not be on a basis of proration in which supply is adjusted to demand. Under engineering conservation, he said, there would be more oil produced but, he suggested, it could be stored against the time when supplies were reduced or demand increased.

As a remedy for the monopoly conditions which prevail as a result of proration and pipe line ownership by the integrated companies, he suggested that either proration should be repealed or federal control and price fixing extended to include refining and marketing or by complete disintegration, separating permanently the various branches of the industry.

Discussing the situation which led to the acquisition of Mexican oil, Walsh explained that "we began our operation on Mexican crude in August, 1938, after 9 months search for American crude oil on which our thoroughly modern refinery could be run at a profit; after 9 months of operation at a loss, during which period we saw our hard-won assets disappear under the steady erosion of the hard rasp of monopoly."

Explaining that the company bought "unexpropriated" oil and pointing out that the Royal Dutch Shell interests owned about 80 percent of the value of the properties expropriated, the statement continued:

Warned Against Deal

"We did not want to purchase Mexican oil. Immediately after the expropriation decree the word was posted that it would be bad business to handle any Mexican crude. Before we made our contract to purchase this oil we were warned by the head of the Shell interests here that if we purchased any Mexican crude, whether it was derived from wells owned and operated by the Mexican government prior to expropriation or not, we would be put out of business in two months' time. After this warning we expected interference with our customers, interference with our necessary bank credits, intimidation of the brokers through whom we normally marketed our products. We met with this interference, this illegal restraint, from the Shell company, to the serious damage of our business.

"As we have said, we reluctantly made a contract to purchase Mexican crude. We realized that if we did so we could not sell to the major companies who had been our large customers. We knew we could not sell to the Shell company who had purchased almost all of the gas oil we had manufactured for the last 2 years; we had been warned, as we said before, by the great British-Dutch trust that they would put us out of business. We knew our broker friends would be afraid to deal with us.

"We realized that not even the fact that we were buying unexpropriated oil would save us from this attack. We knew, of course, that in the Poza Rica field from which we were to obtain this crude there were never any American producers and that all the American major companies knew this. We knew that every American company which had had Mexican interests knew that the Mexican government had owned a large and prolific portion of this Poza Rica field before expropriation and had drilled its own wells thereon and was producing from these wells at the time we made our contract, the full 15,000 barrels which we required. We knew that we could prove legally that we were buying only non-expropriated oil.

"If we could have purchased American crude, in view of this situation, we would not have made this Mexican contract. We had, however, a Hobson's choice. We could not operate unless we bought Mexican crude, the Shell said they would not let us if we did."

Cole Bill Opposed

A bitter fight against the administration-sponsored Cole oil bill was foreshadowed last week by Karl A. Crowley of Fort Worth, representing independent Texas producers.

Appearing before the Temporary National Economic Committee September 29, Crowley expressed total disapproval of the measure, on which a subcommittee of the House Interstate Commerce Committee is expected to hold hearings this month.

Saying that he did not wish to discuss the bill before the Temporary National Economic Committee, Crowley said "I am unutterably opposed to the Cole bill and I do not think there is an independent oil producer in Texas who is in favor of it."

Enactment of the bill, he continued, would give the last vestiges of control of the industry to the major companies.

"It requires a certificate of public convenience to drill a well or open a filling station in Ottumwa, Iowa," he asserted.

Full disintegration of the industry was seen by Crowley as the only remedy for monopoly by the major companies.

Presenting a 127-page brief on behalf of a number of independent operators, Crowley suggested "complete separation of the integrated oil companies without capital loss to them," declaring that "no person can show that the public welfare requires that these branches be integrated any more than it can be shown that an integrated industry should control every phase of other essential industries such as the production of food stuffs and clothing.

"The only result of allowing these major integrated companies to continue to operate as they do is to award to them special privileges not accorded to other citizens of the country," he asserted. "It allows them to control the supply and as it passes through their hands, to take whatever toll they desire from the buying public. In short, these are the means by which there has been established a monopoly of essential industries whose profits continue to whatever amount the owners of this monopoly may desire. With careful planning and unwritten understandings the major companies can almost determine from year to year what profit they desire to make. Constant, steady and momentous earnings of these companies throughout the period of the world's greatest depression prove the truth of the statement that oil prices have not followed other commodity prices or the natural law of supply and demand. There need be no dislocation

of the industry in order to achieve 'true competition'," he continued. "A sound application of laws to prevent acts being committed that will result in restraint of trade is all that is necessary and property rights need not be distributed but only management of the several branches of the industry transferred. If Congress would provide by law that no person, firm or corporation engaged in interstate commerce in either of the four branches of the industry should be permitted to engage in any other it would simply mean that the four branches would be separated and that the producer would sell to the processor of the raw material these materials, using the recognized transportation facilities, and that the manufacturer would sell at competitive prices the finished product," Crowley said.

The power of Congress to regulate commerce between the states is undisputed, he told the committee, and the ground work for such legislation is laid by the Hepburn act and the sustaining of its validity by the Supreme Court.

With continuance of present conditions and trends, he argued "as the supply of oil grows less the price will inevitably be higher.

"When the independent quits prospecting, drilling and producing oil then the supply is bound to become smaller. With an excuse so readily manufactured the majors can say that an increase to much higher prices is justified in order to compel oil users to take some other form of fuel. In fact that is now the basis upon which various pressure groups including oil men work when they lobby for high tariffs on foreign oil. They have in mind depriving the people of the country of an opportunity to get additional supplies of oil at cheaper prices than they can obtain here.

"Experience has proved that the control of production, manufacturing and distributing has inevitably worked to the detriment of the consumer and no well-informed person will contend for a minute that if production, refining and distribution are curtailed in the manner set forth that we will have 50-cent gasoline instead of 10-cent gasoline."

The only alternative to disintegration he said, is full federal control, which would not work out to the benefit of the independent interests because of the powerful influences that would be exerted upon the governing agency by the major companies.

Crowley explained the situation leading to the six-state shutdown saying it was a fine and courageous action by Ernest O. Thompson of the Texas Railroad Commission, who proposed it.

"We are not in favor of such a step as a general thing," he said "this was an exceptional case."

Every producer in Texas was in favor of the suspension he told the committee saying the time had come for a showdown whether the industry was to be controlled by "Standard and Sinclair" or by the governmental authorities.

Ten Firms Control Reserves

Ten companies own approximately half the gross proved oil reserve of the United States it was testified by E. DeGolyer, Dallas, who declared that the Standard of New Jersey group, including the Humble Oil & Refining Company, is outstanding with regard to reserve position, with almost two and one-half billion barrels of gross proved reserve.

The Standard group is followed by four companies with gross proved reserves of the order of magnitude of a billion barrels each; approximately three companies are in the one-half to three-quarter billion barrel class; nine or ten are in the one-fourth to one-half billion barrel class; six to eight companies have 100,000,000 to 200,000,000 barrel reserves, and probably a dozen companies have from 50,000,000 to 100,000,000 barrels.

"On a net basis," DeGolyer said, "approximately one-third of the nation's reserves are owned by the so-called old Standard companies; one-fourth by small companies or individuals some of which have a reserve of as much as 25,000,000 barrels; one-fifth by the ten principal independents, and from one-sixth to one-eighth is royalty owned by landowners and royalty owners.

Smaller Withdrawals

"Whether by force or circumstances or design, the big companies are able to market their reserves less rapidly than are the small companies and individuals. The ten largest companies estimated to own one-half the gross proved reserves produce 31.5 percent of the nation's production, the thousands of individuals and smaller companies owning the other half of the proved reserves have a gross production of 63.2 percent. The Jersey group's reserves are being produced at approximately 40 percent of the rated average for the rest of the nation's production."

DeGolyer pointed out that nature appears to have distributed occurrences of oil with about the same degree of unevenness as reserves are now held by corporations and individuals. "With more than 3000 pools discovered in the United States, the mammoth East Texas pool stands first with an estimated ultimate production of three and one-half billion barrels or approximately 10 percent of the total of the nation's past production and estimated proved reserve," he said. "Half the total known oil, past and proved reserve is accounted for by 30 to 40 pools. These are at least 2 one-billion barrel pools; ten or more half-billion barrel pools; dozens of hundred million barrel pools; scores of 25,000,000 barrel pools; and hundreds of lesser pools."

The production branch of the industry now is in its fourth, or "proration," period, the witness declared in tracing historically the development of the industry. The first, he said, was the lamp and lubricating oil period, from 1859 to 1900; and was followed by the fuel-oil or transition period, 1901-10, and the motor-fuel period, 1910-30.

The present period which began in 1921, he said, "is still one in which motor fuel is the all-important product of the industry, but its definite characteristic is that the proved reserves and potential production of the United States have for the first time become so great there is no longer any possibility of the nation's being able to use, export or store all the oil which might be produced by the free, open-flow of existing wells and it has become necessary generally and indefinitely into the future to restrict the output from flush wells in order not to waste the nation's resources.

"Technically this period has been marked by great improvement in the techniques of prospecting and drilling. Geophysics, which was introduced as an aid to prospecting in the early mid-twenties, has become of great importance, the rotary has been almost universally used for drilling and a marked increase in drilling depths has been notable. Many inventions, such as electrical coring, gun perforation and stage cementing have become a part of standard practice and greatly increased the value of the rotary as a prospecting tool. This period has also seen the rise of petroleum engineering as a distinct profession and has been marked by a great improvement in the technique of production."

DeGolyer devoted much of his presentation to outlining the problems of prospecting and production and the development of modern methods. Proration, he explained, was adopted as a means of conserving oil reserves and is "by no means perfect."

There are many problems which must be solved and among other things attention must be given to insuring conditions of reasonable price through "the necessary prerequisite of providing reasonable costs."

He also criticized the practice of drilling 7-inch holes to the producing sand and then choking them to a fraction of an inch at top and bottom and the policy in some states of basing allowables too much on potentials and individual wells which forces close spacing.

"We do not know too much about well spacing," he admitted. "Unfortunately the individual oil pool once exhausted under a certain well pattern, cannot be restored and again produced under a different well pattern for comparative purposes, and an oil pool is a unique thing."

Trial for title to Elk Hills field reopened

Reopening for argument action against the Standard Oil Company of California over title to the Elk Hills oil field of Kern County was revealed late last week in reports from San Francisco. The United States Circuit Court of Appeals reopened the case and the arguments will be heard on the court's November calendar.

The Federal Court in Los Angeles quieted title to the land in favor of the government, awarding $6,214,102 judgment against Standard. The suit was originally filed by the government which sought title and also recovery to extent of the value of oil and gas taken from 692 acres which now constitute a naval oil reserve. The court took the case under submission last February, but announced last week that Judge William Denman had disqualified himself and the remaining two judges were unable to reach a decision.

Standard Oil Company of California contended it received title to the oil field as an outgrowth of the federal government's deeding certain land to the state as school grants in 1853. The present controversy centers around the question of whether or not in 1903 the lands were known to have been valuable in mineral deposits.

Proration Picture

Texas continues production holidays, orders 11 such days in October . . . Thus, U. S. output to remain near Bureau quota despite overproduction in Illinois

Effective crude control promised by allowables

Relatively effective control of crude oil production is promised under October allowables, despite the fact that restrictions will not be as stringent as in some recent months.

The seven prorated states of the Southwest that yield about 85 percent of the country's production have adopted allowables which in the aggregate are 66,833 barrels daily or 2.2 percent under market demand, as estimated by the Bureau of Mines.

Illinois, not having proration and producing materially more than indicated market demand, will tend, however, to offset the "underproduction" of the prorated states. In recent weeks, Illinois has been overproducing its demand estimate more than 75,000 barrels daily.

Arkansas, California, and Kansas propose to produce only a little more than indicated demand, and New Mexico and Oklahoma will use the Bureau of Mines estimates of demand as their allowables. Louisiana's October allowable is slightly under the bureau allocation, and Texas will start off with an allowable under the indicated demand, although the authorized production increases gradually with completion of new wells.

Details of the state allowables and estimated market demand appear in an accompanying table.

Texas fields to be shut down 11 days in October

The Texas Railroad Commission has entered an order for October fixing an allowable of 1,360,563 barrels daily for the state. All allowables as effective on September 18 remain in effect, but all fields, including East Texas, will be closed down for 11 days during the month. The basic allowable is 2,018,672 barrels, but actual production will be about 84,237 barrels below Bureau of Mines estimates of consumer demand for Texas oil. All fields formerly exempt from shutdown orders will be exempt from the new order, commission officials said.

In a prepared statement Railroad Commissioner Jerry Sadler, who with Commission Chairman Lon Smith signed the order, said:

"Statewide Saturday and Sunday shutdowns will be continued in the October order by reason of the fact that if they were lifted, the marginal well law would prevent the state from keeping within the Bureau of Mines estimate and the production figure would greatly exceed that figure.

"In addition to Saturday and Sunday shutdowns during October, the first Monday and last Friday of the month will also be shutdown days. This will be a total of 11 days during October, during which production for the state will be shut in.

"The Bureau of Mines estimate for October is 1,448,000 barrels per day. The Texas production for October will be 1,360,563 barrels, or 84,237 barrels less than the Bureau of Mines estimate.

"The factor which has caused the commission to change its previous intention of lifting the two-day shutdown for a'l of Texas, except East Texas, has been the marginal-well law as it would affect the state's production in relation to the Bureau of Mines estimate. The commission is determined to keep production within the estimate and this order will accomplish that purpose. It cannot be done by lifting the state-wide shutdowns because of the marginal well law."

Commissioner Thompson was in Washington attending hearings of the anti-monopoly investigation, and had no opportunity to sign the order.

Basic allowables by districts are as follows: Panhandle, 88,241 barrels; Moore County, 1721 barrels; Osborne area, 611 barrels; East Texas, 690,000 barrels; North Texas, 128,556 barrels; West Central Texas, 64,890 barrels; West Texas, 301,532 barrels; East Central Texas, 122,435 barrels; Southwest Texas, 318,798 barrels; Gulf Coast, 298,-928 barrels. This gives a total of 2,015,-712 barrels, but some difference probably exists between this and the scheduled allowables.

No increases were granted on applications heard during the past few days. Sadler said the commission would not consider these until the records have been transcribed and the commission has had an opportunity to review them, which will require from two to three weeks.

Purchases seek higher Texas allowables

A long series of hearings conducted by the Texas Railroad Commission in Austin last week brought out many new features, as operators sought higher allowables for the fields.

In order to eliminate special allowables, the commission at its last statewide hearing announced that all future applications for special increases must be set down for hearing. At the same time, the Independent Oil Producers Equity Association announced it would appear at each hearing, presumably to see that equity was done to all operators, and last week, Senator Clint Small examined each witness. Near Small sat Frank Herrald, petroleum engineer for the new association, furnishing Small with suggestions on technical points.

For the first time in the history of proration, the Texas oil producers objected to allowable increases for the fields, although purchasers were there to ask for increases.

During the course of the hearings, a great deal more emphasis was placed on waste than has been the practice in the past. Dr. F. V. L. Patten, railroad commission petroleum engineer who held all the hearings, carefully examined each engineer, especially as to variation in gas/oil ratios, different rates of flow, and as to the effect of oil production on bottom-hole pressures in each field. Virtually every applicant appeared with engineers to support his contention that the oil could be produced without waste.

Patten likewise was careful in his investigation of demand as presented by the various applicants. Wherever possible, he asked to see the contracts calling for additional oil, although these were not made a part of the official record.

Another interesting feature was the application for an increase in the Saxet Frio, where engineers testified that some of the wells must be produced at rates as high as 1772 barrels in order to obtain an efficient rate of flow.

Loma Novia, Hoffman and Clarkwood

The outstanding example of this change in attitude was in the Loma Novia, Hoffman and Clarkwood fields. Amsco Refining Company and Southwestern Oil & Refining Company both appeared and asked that the allowable for these fields be increased. No technical testimony was furnished; the prospective purchasers were willing to buy 175,000 barrels monthly more than they had been purchasing. They testi-

Allowables for October Under Indicated Market Demand

(Barrels Daily)

STATE	Bureau of Mines Forecast of Demand	State Allowable Beginning of Month	Excess or Deficiency of State Allowable	Percent Excess or Deficiency
Arkansas	56,100	65,800	+ 9,700	+ 17.3
California	594,800	*598,300	+ 3,500	+ 0.6
Kansas	170,600	†176,600	+ 6,000	+ 3.5
Louisiana	260,300	258,504	— 1,796	— 0.7
New Mexico	114,200	114,200	.....	.....
Oklahoma	424,200	424,200	.....	.....
Texas	1,444,800	1,360,563	— 84,237	— 5.8
Total seven States	3,065,000	2,998,167	— 66,833	— 2.2
Other States	525,300	.....	.....	.....
Total United States	3,590,300	.....	.....	.....

* Recommendation of Central Committee of California Oil Producers.
† Umpire's estimate.

fied that all the available storage of the particular crude they buy had been absorbed and that Amsco had been closed for about three weeks as a result of the statewide shutdown. Representatives of each refinery said they could not get the oil anywhere else. It is used to supply burner oil and heavy naphtha, and little or no gasoline is produced.

After the request had been made, various operators from each of the 3 pools affected announced that they had no desire to produce more oil at the present time. While only one of them mentioned price, it appeared that they might mean they were unwilling to sell more oil at present prices.

However, Jake Hamon and Ralph Ogden, both of whom operate wells in these fields, announced that they were contemplating repressuring some of the sands. They indicated that they thought an increased allowable might interfere with such a program.

Talco

An application for an increase in the allowable for Talco crude met with similar opposition prior to the time the hearing was to be called. Producers advised the prospective purchasers that they planned to oppose any increase. For this reason attorneys for the applicant asked that the application be withdrawn, and the case did not come up for hearing.

Saxet and Saxet Frio

Operators in the Saxet Frio field presented what proved to be the most unusual application of the entire group. At the present time, these wells are permitted to produce about 88 barrels per well. Testimony presented by Harry Elliott, Jr., petroleum engineer associated with Stanley Gill of Houston, showed that 9 wells which he listed must be produced at rates of flow varying from 60 to 1772 barrels daily.

The wells are owned by C. Andrade, III, Amtex Production Company, Great States Oil Corporaton, and North Star Oil Company.

Elliott said that the oil beneath the wells which he described was in the sand in the form of an emulsion with the water. For that reason, he contended that there was no water-oil contact. He insisted that it was necessary to produce a large volume of fluid now to prevent trapping the oil in the sand. He said that if the rate of flow was restricted and the bottom-hole pressure sustained, the oil would not move up the structure as engineers believe occurs normally.

Each well has been tested at various rates of flow, and Elliott recommended that they be produced at what he termed the most efficient rate, which was at that point where the water-oil ratio and the gas/oil ratio were at a minimum. In every instance, he urged a material increase.

One example he cited was that of a well which at 16 barrels daily, the amount allowed now, produces 99 percent water and has a gas/oil ratio of 55,700 to 1. He thought this well should be produced at 60 barrels daily 7 days each week, and tests he had made showed that only 95 percent water was produced and the gas/oil ratio dropped 10,200 to 1. The producing conditions in other wells were similar.

While Elliott agreed that the best procedure ordinarily was to limit production to a rate that would conserve bottom-hole pressure, he insisted that peculiar operating conditions in this field caused that method to contribute to, rather than prevent, waste. The Terminal Refining Company has agreed to take as much as 8500 barrels daily under contracts which are made now.

Sand Hills

An increase of 868 barrels daily in the allowable for the Sand Hills Permian production in Crane County was requested by T. B. Cranfill and other operators in that field. There was no opposition to this increase.

The wells are now permitted to produce 21 barrels daily on a 7-day week and would be allowed 31 barrels at the higher rate. Since production is at about 4400 feet, the current allowable of 21 barrels is 4 barrels less than the marginal allowance. Humble would buy the additional oil.

Manvel Oligocene

The Texas Company requested an increase of 2000 barrels daily for wells producing from the Oligocene horizon of the Manvel field, Brazoria County This increase was opposed by the Independent Oil Producers' Equity Association. The Texas Company presented evidence to show that the oil was especially useful in making certain grades of lubricating oils, and that during the past year the pressure has risen 13 pounds in the 5100-foot sand and dropped 27 pounds on the 5600-foot sand. The Texas Company petroleum engineer, E. P. Hayes, testified that the additional oil could be produced without waste, and James Pipkin, attorney for the company, said that it would buy the oil.

An increase of 1810 barrels daily for the Emperor field, in Winkler County, was requested by the Emperor Oil Company. There was no opposition to this request.

The increase would amount to 5.7 barrels per well for wells which are producing about 20 barrels daily now.

Equity Association formed by Illinois oil producers

Formation of the Illinois Oil Producers Equity Association to foster "true conservation, with particular emphasis on its relation to the specific needs of the Illinois oil industry," was announced last week at Centralia by Dorsey Hager, geologist, who has been designated as the new group's technical advisor.

"The new association was generated by spontaneous demand of oil producers who feel existing oil organizations within the state are not representative of true Illinois needs and are too closely allied with outside organizations which have principal interests outside Illinois to guarantee equity will be accorded Illinois oil men," Hager said.

While a definite stand on proration legislation has not been taken by the group pending further examination of the question, the association was said to evidence "efforts of a group of active Illinois producers now united for a common purpose, which includes an honest desire to insure adequate representation and full cooperation with all bodies, legislative and otherwise, now seeking certain changes in methods of oil operation in Illinois—particularly through enactment of state legislation."

Officers and directors of the group, which is establishing headquarters in Centralia, will be selected shortly.

Plymouth and East White Point

A higher allowable for the Plymouth and the East White Point fields in San Patricio County was requested by Republic Oil & Refiing Company. The oil is especially desirable for producing aviation gasoline, according to evidence presented to the commission.

At the present time, the field is allowed 100 barrels per well on a 5-day basis, and Republic asked that it be allowed to produce 108 barrels per well on a 7-day basis. Engineers for the company testified that this was the most efficient rate of flow for wells in that field.

D. W. Hovey, vice president of the Republic, testified that the company is now 300,000 barrels in arrears on its contracts, and he presented evidence of further contracts which were pending.

Senator Clint Small, speaking for the Independent Oil Producers' Equity Association, directed his examination of the witness to the problem of obtaining the oil from other fields in the area. The applicants insisted that they had found a market and that, since they were able to produce the oil without waste, they were entitled to the increase.

Representatives of the Stanolind and Sun companies, owners of a few wells in the Plymouth field, objected to the increase because they thought the higher rate of flow would result in waste.

Benavides and Longhorn

An allowable of 100 barrels daily for wells in the Benavides and Longhorn fields was requested at another hearing before the railroad commission. There are 59 wells in the Benavides field which would be affected by the change and 34 wells in the Longhorn field. The allowable is approximately 84 barrels per well on a 5-day week.

Navarro Oil Company and Southwood Oil Company objected to the increase in allowable for the Benavides field, protesting that the data presented was insufficient to prove the oil could be produced without waste. They recommended that further tests of their wells and those of other operators be made before any increase is ordered.

Placedo, East Placedo, Keeran, Heyser, McFadden and Greta

An increase of 100,000 barrels per month, or approximately 3000 barrels daily for the Placedo, East Placedo, Keeran, Heyser, McFadden and Greta fields was requested by Barnsdall Oil Company. The additional crude would supply the company's Corpus Christi plant.

Contracts presented had been made several months ago, when field allowables were slightly higher and before the 15-day shutdown. It appeared that this had been the cause for the reduction in supply and that Barnsdall was far short of its needs. The company re-

lied principally on its demand as the basis for the increase.

An increase of 1000 barrels daily in the allowable for the Rogers field, Montague County, was requested by Rogers and Rogers, owners of three of the five wells in the area. The oil would supply the local demand of the Tidal Refining Company. Technical testimony showed that the wells have a capacity of 300 barrels daily and are currently allowed to produce 100 barrels during the 5 days of each week. Production is from Pennsylvanian sands at 4650 and 4300 feet.

Eureka Heights

Operators in the Eureka Heights field, Harris County, asked for an increase of 1000 barrels daily to supply oil to the Crown Central Refining Company. The crude would supply a foreign demand and would probably be consigned to British, French, and Swedish buyers. Testimony showed that the only comparable crude which has a high gas oil content is produced in the Jennings, Louisiana, field.

Louisiana proration decision not ready

A decision in the alleged proration discrimination case in Louisiana which was expected late last week, was not handed down by the three judges who heard both sides on September 18, and asked for more complete briefs as well as written arguments.

The case was styled George Lilly vs. the Louisiana Department of Conservation and Ernest S. Clements, conservation commissioner, and claimed the department had discriminated against the plaintiff in the matter of allowables set for the Eola field, in Avoyelles Parish.

Lilly's attorneys claimed his well in the field had been given a 69 barrel allowable, as compared with other wells allotted up to 250 barrels, and when protests were made this allowable was cut to 29 barrels.

Conservation department attorneys said the allowable had been set on a basis of the oil-gas ratio. Shreveport District Judge Ben C. Dawkins, who with New Orleans District Judge Wayne G. Borah and Circuit Court of Appeals Judge Edwin R. Holmes, is hearing the case, asked if this method of setting allowables was used for all the wells in the field, and when the reply was that the Lilly well was the only one so gauged, the judges asked the plaintiff to file written arguments and the conservation department was to be allowed three days to file a reply, and the court would take the case under advisement.

Robert Hardwicke, Fort Worth attorney representing Amerada Petroleum Corporation and Sid Richardson, who together own more than half the field's 24 wells, appeared as a friend of the court and argued for the conservation department's rulings.

At the beginning of the trial the plaintiff agreed to withdraw one of its four causes for action, wherein it was stated that Louisiana's conservation laws are in violation of the Bill of Rights and are, therefore, unconstitutional.

At the request of the judges, this cause was taken from the brief when Lilly's attorneys said that the action had been misconstrued as a political move and they were willing to drop all claims in this direction.

Atkinson bill placed on California ballot

Last week the State Supreme Court of California ruled that the referendum against enactment of the Atkinson oil control bill would be placed on the November 7 ballot to be voted upon by the people of California.

Efforts were made by Assemblyman Maurice E. A. Atkinson of Long Beach, author of the bill to prove that many signatures secured by petitioners were fraudulent and void on legal grounds. Handwriting experts were called upon to prove to the court that many names had been written into petitions by one circulator. However, early last week the court denied the action and ordered the bill to go on the ballot.

Many of those supporting the bill 60 days ago are now reported to be against it on the grounds that control is no longer necessary.

Restrictions on purchases are lifted by South Penn

South Penn Oil Company last week anounced, effective October 1, it would lift restrictions on crude oil purchases in the Bradford-Allegany field. The company's announcement follows that of Tide Water Associated Oil Company. For several months both companies had been taking only 75 percent of the base figure set in their purchase contracts with producers in the Pennsylvania-New York area.

California's allowable 598,300 barrels daily

The Central Committee of California Oil Producers voted to retain for October a quota of 598,300 barrels daily and cut the top allowable for 552 wells 10 barrels daily each at the regular meeting last week in the assembly rooms of J. R. Pemberton, oil umpire.

The top per well allowable was originally 250 barrels daily and this has been cut back to 220 barrels daily during the past 3 months.

Lawrence Vander Leck, chairman of the committee, revealed the appointment of a subcommittee that will operate in an advisory capacity for the purpose of reviewing the method establishing well potentials by use of subsurface methods. This special committee is now preparing rules, the procedure of which will ultimately be used by the oil umpire's personnel. It is headed by E. G. Trostel, who will be assisted by E. V. Watts, D. L. Caldwell, Read Winterburn, R. W. French, Malcolm Morris, E. J. Bartosh, E. W. McAllister and W. W. Lupton.

Texas July output up but per well yield less

Figures released by the Texas Railroad Commission last week showed that although the state's production in July was higher than a year ago the output per well declined considerably due to the increase in producing wells. The figures also revealed that the state's crude production was less than the allowable assigned.

During the past July, the report showed, production of oil amounted to 1,352,791 barrels, or 60,881 barrels daily more than was produced during the month of June and 34,305 barrels greater than in July a year ago. The allowable for July, 1939, totalled 43,633,502 barrels, or an average of 1,407,532. Therefore, production was 3.89 percent less than the allowable assigned.

The daily average allowable per well was 15.99 barrels, or .79 barrel more than the average for June. However, in July, 1938, the daily average allowable per well was 16.8 barrels, or .81 barrel more than the average for the same month in 1939. Daily average production during the past year declined from 16.4 barrels per well to 15.36 barrels, a loss of 1.04 barrels. This showed that the daily per well production is now lower than a year ago, despite the higher total allocation.

The decline in daily average production was due to the increase in number of wells. The railroad commission listed 88,021 producing wells, including 35,879 flowing wells and 52,142 pumping wells. This was an increase of 5693 wells during the year, of which 2728 were flowing and 2965 were pumping wells.

Of the oil produced, 41,185,823 barrels was transported by pipe lines, 120,710 barrels was shipped by tank cars, 255,524 barrels were transported by truck, 8306 barrels was used for fuel and 26,679 barrels were used for miscellaneous purposes.

In the accompanying table the comparative figures for July, 1938, and July, 1939, are given.

Comparison of Texas July Production Data

	JULY			
	1938	1939	Increase	Decrease
Number of Operators	5,522	5,882	360	.....
Number of Leases	16,018	16,846	828	.....
Number of Flowing Wells	33,151	35,879	2,728	.....
Number Pumping Wells	49,177	52,142	2,965	.....
Total Producing Wells	82,328	88,021	5,693	.....
Lease Storage (Begin)	4,811,887	4,985,285	173,398	.....
Total Allowable	42,968,725	4,363,502	664,777	.....
Daily Average Allowable (30 days)	1,386,088	1,407,523	21,444	.....
Daily Average Allowable per Well	16.8	15.99	.....	.81
Indicated Production	41,902,226	41,936,531	34,305	.....
Daily Average Indicated Production	1,351,685	1,352,791	1,106	.....
Daily Average per Well	16.4	15.36	.....	1.04
Runs to Pipe Line	41,397,123	41,185,823	.....	211,300
Tank Car Movement	83,837	120,710	36,873	.....
Truck Movements	199,625	255,524	55,899	.....
Fuel	15,669	8,306	.....	7,363
Miscellaneous	27,970	26,679	.....	1,291

Market Situation

Outlook for markets remains generally favorable despite several domestic handicaps as inquiries from European nations at war hit United States

Numerous European inquiries for oil; orders not yet placed

British inquiries for export shipment hit the American market during the latter part of last week and while, of course, no shipments have come as a result of such inquiries, numerous though they have been, there is a feeling that an upward swing in the gasoline market is near. The lubricating oil market is feeling distinctly the increase in consumption.

In the oil country there is a great deal of talk of premiums for high-octane-gasoline-content crude. One broker is reported to have offered a premium of 28 cents per barrel with no sellers. It is also reported that some crude has recently sold at a premium of 26 cents above the posted price while a large producer is reported to have contracted some of its production at 8 to 9 cents above the posted price for a period running into 1941.

In the Corpus Christi area, where the demand for high-octane-content crude has been very brisk, one of the largest tankers in the world, of Italian ownership, is lying at the docks, awaiting assembly of cargo and the clearing up of certain matters regarding credits.

Until the latter part of last week the Allies had been noticeable by their absence in the market. Late on the twentieth of the month the inquiries from England began to come in and brokers and sellers have been busy since.

Informed sources say that it will be 60 to 90 days before the inquiries work into actual shipments but the general effect of them already is being felt.

The American supply will be called on for a great deal of oil if the European conflict extends into a long period. There were some observers in New York who expressed the thought that possibly the war might come to a quicker end than is generally expected, but all sources seems to think that no greater dependence can be put on Iraq and Iran than has already been put due to the fact that the lines already have been running at capacity.

Iran, Iraq and South American crudes are not expected to play a big part in filling the demand for lubricating oil. Paraffine-base crudes will be called upon to carry that burden and demand for bright stocks and neutrals is already very heavy in the United States.

There is talk of a possible price increase in high-octane-producing crudes, this talk being reinforced by premiums now being offered and paid.

Markets remain strong despite some handicaps

The market outlook remains generally favorable, with prices of crude and products firm at the present improved levels, although some uncertainties and difficulties are involved in the current situation.

Crude oil production allowables reflect the premature enthusiasm over the export outlook, quotas for October being more liberal than those of the past.

Although the prorated states propose to stay within market demand as estimated by the Bureau of Mines, production for the country as a whole may go substantially above national requirements, as Illinois continues to produce without restriction and materially in excess of indicated demand, while California has continued to exceed the official allowable.

Illinois Remains Problem

Although the Mid-Continent shutdowns and the commencement of the European war have greatly strengthened the markets, the industry still has an unsolved problem in the flush and steadily increasing Illinois production. It was that problem that largely caused the marking down of crude prices at the middle of August, and although the six-state oil field shutdowns provided temporary relief and restoration of postings, Illinois over-production still exists and it still exerts an adverse effect on the crude markets.

Gasoline Market in Danger

Another problem that has not been solved but only forced temporarily into the background is that of properly holding down gasoline inventories this fall and winter when refiners are called upon to maintain large refinery runs in meeting record demand for heating oils.

Normally, considerable concern probably would be felt currently over the level of gasoline stocks, but expectations of large exports have held down such anxiety.

The stocks of gasoline in the United States are over 2 percent larger than at this time last year. It is true that gasoline demand has been running about 5 percent higher in 1939 than in 1938. But the better demand does not justify larger stocks than those of a year ago, which were obviously excessive, as evidenced by the fact they caused abnormally low prices.

The danger of increasing gasoline

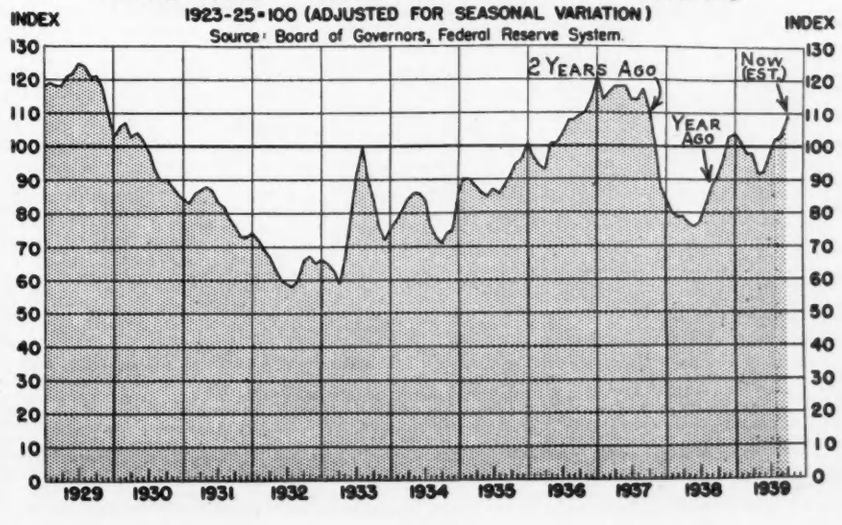
OIL MARKETS STRENGTHENED BY SHARPLY INCREASED INDUSTRIAL PRODUCTION

Current strong markets in the oil industry probably have been caused in considerable measure by recent sharp increases in industrial production in the United States.

Following a set-back in the early months of this year, industrial output has been sharply advancing, and it now is closely approaching the highs reached in 1937.

The Federal Reserve Board index of industrial production is expected to be up to about 110 percent of the 1923-1925 average for September. It was at 102 in August, 101 in July, 98 in June, and at 92 in May and April, low point of the year.

INDUSTRIAL PRODUCTION INDEX - BY MONTHS



stocks to seriously burdensome proportions will be ever-present during the fall and winter, inasmuch as heating oil demand is up nearly 20 percent, in contrast with the 5 percent higher gasoline demand. Moreover, stocks of heating oils are only about the same now as a year ago. It is evident that refinery output of those oils this fall and winter will have to be exceptionally large to meet the market requirements, and in fulfilling the demand, plant owners will have to exercise extreme precaution against over-building gasoline stocks. The gasoline inventories will not be satisfactorily held down unless heating oil yield from crude is relatively large while gasoline yield is comparatively small.

Crude Prices Advanced

The past week brought some additional advances in prices of both crude and refined oils.

Effective September 22, crude oil prices affecting 40 percent of Michigan's production were advanced 7 cents a barrel. The advance pushed prices of southwestern Michigan crudes to a top of 95 cents a barrel. The increases were attributed to a general strengthening of the markets, which has attended increased industrial activity in the state.

Some further advances were made in lubricating oil prices at the refineries in the Appalachian district and in the Mid-Continent, and the increases gave added strength to the markets for Pennsylvania grade crude, which furnishes quality lubricants.

Refiners were still unable to supply the great demand for lubricants of all kinds.

The large demand is of both domestic and foreign origin. The neutral oils, bright stocks, and cylinder oils in the Pennsylvania district have been advanced from 3 to 8 cents a gallon within the past month.

Pennsylvania Crude Benefits

The increased demand for Pennsylvania lubricants has caused withdrawals of crude from storage in the area, and crude oil buyers have lifted proration of purchases. Meanwhile, production of Pennsylvania grade crude has been increased to meet the larger demand. And it is indicated that increases in crude price postings may be in store.

Wholesale prices of wax also have been advancing.

Most Products Higher

In nearly all sections east of California there were further advances last week in the wholesale prices of gasoline, kerosene, and various grades of fuel oils.

Movement by boat was hampered, however, by scarcity of tankers and the interference with shipping by the European war.

On the Atlantic coast, prices were marked up on nearly all products by various marketers and resellers, in line with or in extension of the movement of the previous week.

However, some resistance to further advances was shown, particularly on gasoline. In the Chicago territory, some marketers marked prices of some grades of gasoline down ⅛ cent, apparently because of some loosening of supplies.

The markets at Mid-Continent refineries last week were generally stable, and prices were in many cases unchanged, the more settled quotations in the primary markets having been in contrast with the additional revisions by marketers.

Similarly, the market for natural gasoline has become fairly well settled down, although prices are holding at the higher levels to which they rose in recent weeks when the Mid-Continent fields were shut down.

Gasoline Prices

U. S. motor gasoline at Oklahoma refineries ranged last week about as follows: 62 octane and below, 4½ to 4¾ cents a gallon; 63 to 66 octane, 4¾ to 5⅛ cents; 67 to 69 octane, 4¾ to 5¼ cents; 70 to 72 octane, 5¼ to 5½ cents.

Corresponding prices in the Chicago market were: 4⅜ to 4¾ cents, 4½ to 4⅞ cents, 4½ to 5⅛ cents, and 4⅝ to 5⅜ cents.

In East Texas 60-62, 400 end point gasoline was offered for 4½ cents a gallon.

Natural gasoline, grade 26-70, was selling in the Mid-Continent markets f.o.b. refineries at 4¼ cents a gallon, and sales were reported at the same price f.o.b. Breckenridge, Texas.

Kerosene Prices

Kerosene prices f.o.b. Oklahoma refineries ranged from 3½ to 4¼ cents a gallon for the 41-43 water white grade, and from 3⅝ to 4⅝ cents for the 42-44 water white grade; and corresponding prices in the Chicago market were 3⅜ to 4 cents and 3½ to 4¼ cents.

In the Chicago market range oil was priced from 3⅜ to 3⅞ cents a gallon. The No. 1 white oil was priced from 3¼ to 3¾ cents, and No. 1 straw at 3¼ cents. No. 2 straw was 3⅛ to 3¼ cents. No. 3 oil was 3 to 3⅛ cents. No. 5 oils were 65 cents a barrel. The No. 6 oil was quoted at 40 to 45 cents.

Larger crude output and runs feature statistics

The latest statistics of the industry, covering the week ended September 23, reflected less conservative operations at wells and refineries.

Crude oil production was up sharply, as were refinery runs, and a less than normal withdrawal of gasoline from storage occurred, because of increased output at the plants. The heavy crude runs to stills resulted in a further substantial withdrawal from crude stocks, despite the larger output at wells. Inventories of light fuel oils were drawn upon slightly, as cooler weather brought some use for heating. But a small amount of industrial fuel oil was added to storage, despite good current consumption.

Production and Runs

United States crude oil production jumped 258,700 barrels to 3,681,050 barrels daily in the week ended September 23, according to the American Petroleum Institute, as the East Texas field was restored to normal output,

Trends of United States Production and Stocks

Figures are from American Petroleum Institute weekly reports, except those on crude stocks, which are from Bureau of Mines weekly reports

	Crude Oil Production (Barrels Daily)	Crude Runs to Stills (Barrels Daily)	Crude Oil Stocks (Barrels)	Gasoline Stocks (Barrels)	FUEL OIL STOCKS	
					Gas Oil & Dist. Fuels	Residual Fuel Oil
1937						
August 28	[5]3,731,450	3,425,000	309,506,000	66,997,000	112,111,000	
September 25	3,666,300	[5]3,455,000	307,974,000	65,620,000	116,472,000	
1938						
March 19	3,433,550	3,080,000	306,380,000	[1]93,192,000	122,067,000	
August 27	3,388,500	3,255,000	285,029,000	71,754,000	29,747,000	117,179,000
September 24	3,251,150	3,220,000	280,278,000	68,605,000	31,183,000	119,285,000
October 29	3,237,500	3,145,000	275,824,000	67,590,000	33,690,000	120,029,000
November 12	3,243,250	3,180,000	273,394,000	[6]67,551,000	34,175,000	120,491,000
November 26	3,260,900	3,295,000	270,563,000	68,628,000	33,749,000	119,885,000
December 10	3,245,100	3,150,000	[6]269,509,000	68,587,000	32,068,000	118,711,000
December 31	3,201,450	3,115,000	273,024,000	71,695,000	29,082,000	115,741,000
1939						
January 28	3,248,250	3,235,000	271,763,000	77,279,000	26,583,000	112,766,000
February 25	3,328,850	3,185,000	271,758,000	84,597,000	23,419,000	110,252,000
March 25	3,382,350	3,225,000	273,915,000	87,561,000	21,487,000	107,551,000
April 22	3,526,700	3,280,000	277,156,000	[2]87,769,000	21,058,000	105,035,000
April 29	3,568,200	3,405,000	278,440,000	86,794,000	[7]25,844,000	[7]108,409,000
May 6	3,580,900	3,275,000	[2]278,607,000	86,216,000	26,167,000	108,597,000
May 27	3,585,250	3,405,000	278,289,000	84,152,000	26,992,000	109,386,000
June 24	3,452,800	3,430,000	272,297,000	81,733,000	30,239,000	111,726,000
July 1	3,463,000	3,480,000	271,567,000	81,102,000	31,230,000	113,388,000
July 29	3,539,100	3,460,000	268,513,000	77,887,000	34,900,000	114,053,000
August 5	[3]3,909,400	3,445,000	268,982,000	76,431,000	35,601,000	114,512,000
August 19	2,480,550	[3]3,575,000	262,486,000	74,738,000	37,013,000	115,069,000
August 26	[10]1,690,800	3,475,000	246,982,000	73,475,000	37,722,000	116,237,000
September 2	2,283,200	3,375,000	236,643,000	73,194,000	38,228,000	116,022,000
September 9	3,228,650	3,380,000	233,826,000	72,244,000	38,136,000	115,656,000
September 16	3,422,350	3,470,000	[8]233,016,000	71,869,000	38,394,000	115,230,000
September 23, 1939	3,681,050	3,570,000	.....	71,020,000	38,075,000	115,266,000
September 24, 1938	3,251,150	3,233,000	[4]280,945,000	69,524,000	[8]	[9]
Change in past year	+13.2%	+10.4%	—17.0%	+2.2%	—0.0%	—7.7%

[1] All time peak. [2] Peak for 1939. [3] Lowest since April, 1922. [4] Stocks, September 17, 1938.
[5] Peak prior to 1939. [6] Lowest for year.
[7] Prior to April 29, 1939, data did not include stocks at terminals, in transit, etc., except in California.
[8] Available data for year ago include only stocks at refineries, and not at terminals, in transit, etc., except in California. Those stocks on September 23, 1938 totaled 30,389,000 barrels, and comparable stocks on September 23, 1939, totaled 30,382,000 barrels, or nearly the same.
[9] Available data for year ago include only stocks at refineries, and not at terminals, in transit, etc., except in California. Those stocks on September 23, 1938, totaled 119,815,000 barrels, and comparable stocks on September 23, 1939, totaled 110,587,000 barrels, or 7.7% less.
[10] Lowest since October, 1922, due to the shutdown of six Mid-Continent states.

CRUDE OIL PRICE SCHEDULES

MID-CONTINENT GRAVITY SCALE PRICES—Posted October 11-13, 1938

(Some fields of Mid-Continent have flat price postings, and are shown separately)

Gravity	[7]Okla.-Kans.	North La.-Ark.	[9] Schuler, Ark. 9-13-39	North & W. Central Tex.	East Central Tex.	Gray Co. Tex.	Carson, Hutchinson Co. Tex.	[1]Tomball Tex. Type	West Tex.-New Mex.	[2]Gulf Coast (Tex.-La.)	[3]Some La. Gulf Areas	Jennings, La.	[4]Anahuac, Tex. Type	[5]Refugio, Tex. Type	[6]Mirando, Tex. Type	[8]Salt Creek, Wyo.
17–17.9	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
18–18.9	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
19–19.9	.....	.....	.....	.....	.....	.....	.....	.....	*$0.53	*$0.79	*$0.79	.....	*$0.74	*$0.79	*$0.74	.....
20–20.9	$0.60	.....	.....	.....	.....	.....	.....	.....	.55	.82	.82	.....	.77	.82	.77	.....
21–21.9	.63	.....	.....	.....	.....	.....	.....	.....	.57	.85	.85	.....	.80	.85	.80	.....
22–22.9	.66	.....	.....	.....	.....	.....	.....	*$0.95	.59	.88	.88	.....	.83	.88	.83	.....
23–23.9	.69	.....	.....	.....	*$0.78	.....	.....	.97	.61	.91	.91	.....	.86	.91	.86	.....
24–24.9	.72	*$0.73	*$0.63	*$0.71	.80	.....	.....	.99	.63	.94	.94	.....	.89	.94	.89	.....
25–25.9	.75	.75	.65	.73	.82	.....	.....	1.01	.65	.97	.97	.....	.92	.97	.92	.....
26–26.9	.78	.77	.67	.75	.84	.....	.....	1.03	.67	1.00	1.00	.....	.95	1.00	.95	.....
27–27.9	.81	.79	.69	.77	.86	.....	.....	1.05	.69	1.02	1.02	.....	.97	1.02	.97	.....
28–28.9	.84	.81	.71	.79	.88	*$0.72	*$0.67	1.07	.71	1.04	1.04	.....	.99	1.04	.99	*$0.86
29–29.9	.87	.83	.73	.81	.90	.74	.69	1.09	.73	1.06	1.06	.....	1.01	1.06	1.01	.88
30–30.9	.90	.85	.75	.83	.92	.76	.71	1.11	.75	1.08	1.08	.....	1.03	1.08	1.03	.90
31–31.9	.92	.87	.77	.85	.94	.78	.73	1.13	.77	1.10	1.10	*$0.87	1.05	1.10	1.05	.92
32–32.9	.94	.89	.79	.87	.96	.80	.75	1.15	.79	1.12	1.12	.89	1.07	1.12	1.07	.94
33–33.9	.96	.91	.81	.89	.98	.82	.77	1.17	.81	1.14	1.14	.91	1.09	1.14	1.09	.96
34–34.9	.98	.93	.83	.91	1.00	.84	.79	1.19	.83	1.16	†1.16	.93	1.11	1.16	1.11	.98
35–35.9	1.00	.95	.85	.93	1.02	.86	.81	1.21	.85	1.18	.....	.95	1.13	1.18	1.13	1.00
36–36.9	1.02	.97	.87	.95	1.04	.88	.83	1.23	.87	1.20	.....	.97	1.15	1.20	1.15	1.02
37–37.9	1.04	.99	.89	.97	1.06	.90	.85	1.25	.89	1.22	.....	.99	1.17	1.22	1.17	1.04
38–38.9	1.06	1.01	.91	.99	1.08	.92	.87	1.27	.91	1.24	.....	1.01	1.19	1.24	1.19	1.06
39–39.9	1.08	1.03	.93	1.01	1.10	.94	.89	1.29	.93	1.26	.....	1.03	1.21	1.26	1.21	1.08
40+	1.10	1.05	.95	1.03	1.12	.96	.91	1.31	.95	1.28	.....	1.05	1.23	1.28	1.23	1.10

* Minimum price and applies also to purchases of lower gravity.
† Maximum price and applies also to purchases of higher gravity.
[1] Tomball, Raccoon Bend (Deep) and Satsuma.
[2] Includes Barbers Hill, Cotton Lake, Goose Creek, Sugar Land, West Columbia, Thompsons, Mykawa, Nome, Amelia, Webster, Esperson, Orange, South Liberty, West Beaumont, and Clear Lake fields.
[3] Includes Berwick Bay, Bay St. Elaine, Caillou Island, Chacahoula, Dog Lake, Four Isle, Gillis, Hackberry, Horseshoe Bayou, Iberia, Jefferson Island, Lake Barre, Lake Pelto, Leesville, Port Barre, and Vinton fields.
[4] Anahuac, Dickinson, Gillock, Cedar Point, Fairbanks, Turtle Bay, Hull, Liberty, Orange, Pierce Junction, Barbers Hill, Batson, Caplen, Humble, North Dayton, Saratoga, Sour Lake, South Esperson, Spindle Top, West Orange, and Raccoon Bend (shallow) fields.
[5] Includes Saxet, Greta, O'Connor-McFadden, Taft, Plymouth and Tom O'Connor fields.
[6] Includes Duval, Jim Hogg, Jim Wells, Webb and Zapata counties, Texas, and Heyser and Placedo fields.
[7] Oklahoma Pipe Line and Magnolia schedules.
[8] Includes La Barge, Midway Dome, Dutton.
[9] Also Buckner, Village, Magnolia.

Mid-Continent Flat Prices

	Flat Price	Date Posted
Arkansas:		
Smackover	$0.73	10–12–38
Louisiana:		
Garden Island	1.24	10–12–38
Gibson	1.04	10–11–38
Lafitte	1.04	10–12–38
Texas:		
East Texas	1.10	10–12–38
Talco	.55	10–12–38
Livingston, Cleveland	1.10	10–12–38
Van	.93	10–12–38
Pettus	1.29	10–12–38
Pecos County	.78	10–12–38
Pecos Shallow	.65	10–12–38
Luling	.87	10–12–38
Lytton Springs	.99	10–12–38
Salt Flat, Darst Creek, Hilbig, Carroll, Clark and Zoboroski	.96	10–11–38
Flour Bluff	1.27	10–11–38
Guerra	1.06½	5– 8–39
Seabreeze, Willow Slough, La Belle, Hardin, S. China	1.10	9–14–39
Clay Creek	.85	10–13–38
Conroe	1.27	10–11–38
Cayuga	.68	2–16–39
Long Lake	1.08	10–19–38

Middle West Prices

Lima, Ohio	$0.90	10–13–38
Illinois	.95	6– 8–39
Illinois Basin	1.05	6– 8–39
Centralia, Illinois	.95	9–13–39
Princeton, Indiana	.95	6– 8–39
Western Kentucky	1.00	6– 8–39
Birk City, Western Kentucky	.90	6– 8–39
Kentucky River, Eastern Kentucky	1.10	6– 9–39
Big Sandy River, Eastern Kentucky	1.02	6– 9–39

Michigan Prices

	Flat Price	Date Posted
Porter, Greendale, Crystal	$0.97½	4–20–39
Buckeye, Bentley, Edenville and Beaverton	.95	4–20–39
Freeman	.89	4–20–39
Bloomingdale (Van Buren Co.)	.90	9–22–39
West Branch-Arenac-Ogemaw	.70	12–19–38
Allegan-Kent Counties	.95	9–22–39

Rocky Mountain States Prices

Colorado:		
Canon City, Ft. Collins, Wellington, Moffat and Florence	.90	10–11–38
Iles, Light	.98	10–11–38
Iles, Heavy	.92	10–11–38
Montana:		
Cat Creek—Cut Bank	1.10	10–11–38
Sunburst	.90	11–16–37
Dry Creek	.92	10–11–38
New Mexico:		
Artesia	.77	10–11–38
Hogback	1.00	10–11–38
Wyoming:		
Big Muddy	.98	10–11–38
Byron	.55	10–11–38
Elk Basin	.90	10–11–38
Frannie, Light	.55	10–11–38
Frannie, Heavy	.42	10–11–38
Garland	.50	10–11–38
Grass Creek, Light	.90	10–11–38
Grass Creek, Heavy	.40	10–11–38
Hamilton Dome	.35	10–11–38
Lance Creek	.77	10–11–38
Mill Creek	.72	10–11–38
Oregon Basin	.50	10–11–38
Osage	1.30	10–11–38
Poison Spider	.59	10–11–38
Rock Creek	1.00	10–11–38
Tensleep	.646	10–11–38

Pennsylvania Prices

	Flat Price	Date Posted
Bradford Allegheny	$2.00	3– 6–39
National Transit Lines	2.00	3– 6–39
Sw. Pa. Pipe Line	1.65	3– 6–39
Eureka Pipe Line	1.59	3– 6–39
Buckeye Pipe Line	1.55	3– 6–39
Corning Grade, Ohio	1.02	1–24–39

Major Price Changes

	Penna. (Nat. Tr.)	Mid-Cont. (36 Gr.)	Calif. (26 Gr.)
June 19, 1933	Up 10	Up 19	.....
June 26, 1933	Up 10	.....	Up 9-12
July 6, 1933	Up 13	Up 10	.....
July 17, 1933	Up 15	.....	.....
July 28, 1933	Up 15	.....	.....
Aug. 11, 1933	Up 10	.....	.....
Aug. 24, 1933	.....	Up 10	.....
Aug. 30, 1933	Up 15	.....	.....
Sept. 6, 1933	Up 10	Up 10	Up 15
Sept. 8, 1933	.....	Up 15	.....
May 1, 1934	Up 10	.....	.....
Nov. 6, 1934	Cut 25	.....	.....
Dec. 6, 1934	Cut 25	.....	.....
Jan. 4, 1935	Up 15	.....	.....
Feb. 4, 1935	Up 15	.....	.....
May 16, 1935	Cut 15	.....	.....
June 26, 1935	Cut 15	.....	.....
July 16, 1935	Cut 10	.....	.....
Aug. 29, 1935	.....	.....	Cut *1
Sept. 6, 1935	Up 5	.....	.....
Oct. 29, 1935	Up 15	.....	.....
Nov. 1, 1935	.....	.....	Up *28
Nov. 18, 1935	Up 15	.....	.....
Dec. 6, 1935	.....	.....	Up *9
Jan. 9, 1936	.....	Up 10	.....
Jan. 13, 1936	Up 15	.....	.....
Feb. 26, 1936	.....	.....	Up †5
Dec. 28, 1936	Up 12	.....	.....
Jan. 28, 1937	.....	Up 12	.....
Feb. 24, 1937	Up 10	.....	.....
June 7, 1937	Up 15	.....	.....
Sept. 1, 1937	Cut 22	.....	.....
Oct. 12, 1937	Cut 25	.....	.....
Dec. 1, 1937	Cut 15	.....	.....
March 7, 1938	Cut 17	.....	.....
June 13, 1938	Cut 25	.....	.....
Sept. 1, 1938	Cut 12	.....	.....
Oct. 11, 1938	.....	Cut 20	.....
Jan. 21, 1939	Up 12	.....	.....
Feb. 2, 1939	Up 8	.....	.....
March 6, 1939	Up 12	.....	.....

* Signal Hill 26 gravity.
† Seal Beach 26 gravity.

Crude Production Taxes

Oklahoma—Five percent of gross value less royalty interests.
Texas—2¾ cents or 2¾ percent, whichever is higher.
Louisiana—From four to 11 cents a barrel, depending upon gravity.
Arkansas—2.6 percent of gross market value.
Montana—Two percent of gross value at well and ⅛ of 1c per barrel.
New Mexico—Severance tax of 2 percent on oil and gas.
Wyoming and New Mexico—Production tax based upon state and county assessments.
California—.66443 mills per barrel of oil produced and 17.39 cents an acre on proved lands.

following a special closing down for proration purposes. The new rate of production for the nation was 13.2 percent higher than that in the corresponding week last year.

Crude runs to stills were increased 100,000 barrels to 3,570,000 barrels a day, or within 5000 barrels of the all-time peak established at mid-August. The intense activity apparently reflected a further catching-up with current needs by refineries that were forced upon a subnormal basis of operations during the Mid-Continent shutdowns.

Gasoline Situation

Gasoline production was expanded 11,000 barrels to 1,669,000 barrels daily, in consequence of the increased refinery runs, output for the week having totaled 11,684,000 barrels.

Stocks of finished and unfinished gasoline were further cut down by 849,000 barrels, despite the increased plant output, as demand remained remarkably good. At the 71,020,000-barrel level to which the stocks declined, they were 2.2 percent above a year previously. That gain is less than the increase of about 5 percent which has occurred in gasoline demand. But larger stocks than a year ago are not necessarily advisable, as inventories proved to high last year, leading to depressed markets.

Fuel Oil Stocks

Stocks of gas oil and distillate fuels (heating oils) now are practically the same as a year ago. They were reduced about 300,000 barrels to the 38,075,000-barrel level in the week ended September 23. Demand for these oils has been nearly 20 percent better this year than last year.

Inventories of residual fuel oils, used as fuel in industrial operations, were increased by the small amount of 36,000 barrels to 115,266,000 barrels in the week of September 23. At that level, they were 7.7 percent lower than a year previously, although demand has been running about 10 percent higher.

Stocks of refinable crude oil in the United States were further lowered 810,000 barrels in the week ended September 16, the Bureau of Mines reported, having been cut down to 233,016,000 barrels, a new low for 17½ years, or since April, 1922.

Cascade Refining starts running Centralia crude

Following a series of test runs, the new plant of the Cascade Refining Company at Centralia, Illinois, last week began processing Lake Centralia-Salem crude at the rate of 2000 barrels a day. The plant has a maximum capacity of 2800 to 3000 barrels daily. Heading the company are A. B. and C. C. Potter, independent operators who have production in the Marion County pool.

The Central Illinois Oil & Refining Company's skimming plant at Central City, Marion County, is scheduled for completion in mid-October. It will have a capacity of 2000 barrels daily and process Lake Centralia-Salem crude.

Recently completed, the Pana Refining Company's plant at Pana is currently using 3000 barrels of crude daily from the Lake Centralia-Salem and Louden pools. It is one of the few independent refineries with a cracking unit. Chase Savage heads the company. Other officers are George M. Pfau, vice president; G. E. Day, secretary, and Fred H. Luess, secretary.

Southwestern Michigan crude prices raised

A 7-cent per barrel price increase, effective September 22, was posted by the Tri Lakes Corporation, Standard of Ohio subsidiary, in all Michigan fields (Kent, Allegan, Van Buren and Ottawa) where the company is a purchaser. All other carriers followed suit.

The new posting increased Kent, Allegan and Ottawa County grades from 88 to 95 cents per barrel and Van Buren grades from 83 to 90 cents per barrel.

The posting for the one well in the new Zeeland (Ottawa County) area was advanced from 70 to 77 cents and Vandale Corporation advanced the posting for Bangor field (Van Buren County) from 68 to 75 cents. Both Bangor and Zeeland are low gravity, high sulphur content oils.

The 7-cent advance, first important change in Michigan crude prices since April 17-20, of this year, affected all shallow fields in the southwestern part of the state, representing approximately 40 percent of Michigan's current 69,000-barrel daily output. Fields in central and northern Michigan, where prices range from a low of 74 cents in

CALIFORNIA CRUDE OIL PRICES

(Posted February 26, 1936; except El Segundo and Wilmington, posted October 15, 1937, and Greeley and Canal posted July, 1938.) All gravity above those quoted take highest prices of that field.

Gravity	El Segundo and Signal Hill	Seal Beach Alamitos Heights	Huntington Beach	Inglewood	Playa Del Rey	Olinda Brea Canyon	Athens Rosecrans	Torrance	Richfield	Whittier East Coyote La Habra	Montebello	West Coyote Hills	Santa Fe Springs	New Hall McKittrick Kern River Round Mountain	Greeley Canal	Mountain View	Midway-Sunset Buena Vista Hills Elk Hills	Lost Hills	Coalinga	Wheeler Ridge	Wilmington
14-14.9	$0.80	$0.79	$0.78	$0.79	$0.80	$0.76	.....	$0.80	$0.76	$0.76	$0.77	$0.78	.....	$0.70	....	....	$0.70	$0.70	$0.70	.....	$0.75
15-15.9	.80	.79	.78	.79	.80	.76	.....	.80	.76	.76	.77	.78	.....	.70	....	....	.70	.70	.70	.....	.75
16-16.9	.80	.79	.78	.79	.80	.76	.....	.80	.76	.76	.77	.78	.....	.70	....	....	.70	.70	.70	.....	.75
17-17.9	.80	.79	.78	.81	.80	.76	.....	.80	.76	.76	.77	.78	.....	.70	....	....	.70	.70	.70	.....	.77
18-18.9	.80	.79	.78	.84	.80	.78	.....	.82	.76	.76	.77	.78	.....	.70	....	....	.70	.70	.70	.....	.79
19-19.9	.82	.79	.82	.87	.84	.81	.....	.85	.76	.78	.77	.78	.....	.70	....	$0.70	.74	.74	.71	$0.70	.82
20-20.9	.85	.79	.85	.90	.88	.84	.....	.88	.78	.82	.77	.80	.....	....	....	.70	.78	.78	.72	.70	.85
21-21.9	.88	.79	.89	.93	.93	.88	.....	.91	.80	.85	.77	.84	$0.78	....	....	.73	.82	.82	.74	.70	.88
22-22.9	.92	.82	.92	.96	.98	.92	.....	.93	.84	.89	.79	.88	.78	....	....	.77	.87	.86	.78	.72	.92
23-23.9	.95	.86	.96	.99	1.02	.96	$0.84	.96	.88	.93	.82	.92	.78	....	....	.80	.92	.90	.82	.76	.95
24-24.9	.99	.91	1.00	1.02	1.06	.99	.88	.99	.91	.96	.85	.96	.82	....	....	.84	.97	.94	.86	.79	.99
25-25.9	1.03	.95	1.03	1.05	1.11	1.03	.93	1.02	.95	....	.89	.99	.86	Elwood	....	.88	1.01	.98	.90	.83	1.03
26-26.9	1.06	1.00	1.07	1.09	1.16	1.06	.98	1.05	.98	....	.92	1.03	.90	Ter-	.....	.91	1.06	1.02	....	....	1.06
27-27.9	1.10	1.05	1.11	1.12	.....	1.10	1.03	....	1.02	....	.96	1.06	.95	race	$0.91	.95	1.10	1.06	....	....	1.10
28-28.9	1.14	1.10	1.14	1.15	.....	1.14	1.07	....	1.06	....	.99	1.10	.99	....	.94	.99	1.15	1.10	....	....	1.14
29-29.9	1.17	1.15	1.18	1.18	F.O.B.	1.17	1.12	....	1.09	....	1.03	1.14	1.03	....	.98	1.02	1.20	1.14	....	....	1.17
30-30.9	1.21	1.19	1.22	1.21	Pipe	1.21	1.17	....	....	....	1.07	1.17	1.08	F.O.B.	1.02	1.06	1.25	1.18	....	....	1.21
31-31.9	.....	.....	.....	1.24	Line	1.24	1.22				1.11	1.21	1.12	Ship	1.06	1.09	1.29	....	....	....	....
32-32.9	.....	.....	.....	1.27	.....	1.27	1.27	Kettleman Hills			1.14	1.25	1.16	....	1.09	1.13	1.34	....	....	....	....
33-33.9	.....	.....	.....	....	.....	.....	1.32	1.19			1.18	1.28	1.20	1.28	1.13	1.17	1.38	....	....	....	....
34-34.9	.....	.....	.....	....	.....	.....	1.37	....	1.23	....	1.22	1.32	1.25	1.32	1.17	1.20	.....	....	....	....	....
35-35.9	.....	.....	.....	....	.....	.....	1.42	....	1.27	....	1.25	....	1.29	1.35	1.20	....	.....	....	....	....	....
36-36.9	.....	.....	.....	....	.....	.....	1.46	....	1.31	....	1.29	....	1.33	1.39	1.24	....	.....	....	....	....	....
37-37.9	.....	.....	.....	....	.....	.....	1.51	....	1.35	....	1.32	....	1.37	1.43	1.28	....	.....	....	....	....	....
38-38.9	.....	.....	.....	....	.....	.....	1.56	....	1.39	....	1.36	....	1.42	....	1.31	....	.....	....	....	....	....
39-39.9	.....	.....	.....	....	.....	.....	1.61	....	1.43	.....	1.40	....	.....	....	1.35	....	.....	....	....	....	....
40-40.9	.....	.....	.....	....	.....	.....	1.66	....	....	.....	1.43	....	.....	....	1.39	....	.....	....	....	....	....
41-41.9	.....	.....	.....	....	.....	.....	.....	....	....	.....	.....	....	.....	....	1.43	....	.....	....	....	....	....
42-42.9	.....	.....	.....	....	.....	.....	.....	....	....	.....	.....	....	.....	....	1.46	....	.....	....	....	....	....
43-43.9	.....	.....	.....	....	.....	.....	.....	....	....	.....	.....	....	.....	....	1.50	....	.....	....	....	....	....
44-44.9	.....	.....	.....	....	.....	.....	.....	....	....	.....	.....	....	.....	....	1.54	....	.....	....	....	....	....
45-45.9	.....	.....	.....	....	.....	.....	.....	....	....	.....	.....	....	.....	....	1.57	....	.....	....	....	....	....
46-46.9	.....	.....	.....	....	.....	.....	.....	....	....	.....	.....	....	.....	....	1.61	....	.....	....	....	....	....
47-47.9	.....	.....	.....	....	.....	.....	.....	....	....	.....	.....	....	.....	....	1.65	....	.....	....	....	....	....
48-48.9	.....	.....	.....	....	.....	.....	.....	....	....	.....	.....	....	.....	....	1.68	....	.....	....	....	....	....

West Branch to a high of 97½ cents in Greendale, were not affected.

The 7-cent advance was attributed to a general strengthening of markets, in particular stronger markets of independent refiners; a fairly leveled supply under state proration, and new competition in the Kent County field.

Leonard Pipe Line Company had started to bid for connections in the Kent field 3 days before the price advance was posted. Leonard buys around 9000 barrels of crude per day at present, all from central Michigan fields, and of this about 5000 barrels per day is purchased from Pure Oil Company. Unless prices advance in central Michigan, crude from central Michigan now will be from 5 to 10 cents cheaper than that from Kent County.

Another highly important reason for the advance was a new market for Kent and Allegan crudes, which has been building up the past 45 days. Socony Vacuum Oil Company is buying crude from these fields for charging stocks in its Trenton, Michigan, refinery, supplied mainly by Mid-Continent crudes. While exact figures are not available, it was reported that Socony is now taking between 7000 and 8000 barrels per day from the Kent-Allegan area, buying it through Commonwealth and Naph-Sol Pipe Line Companies. Socony has around 3500 barrels of its own production in the Salem field, Allegan County, under current allowables.

Michigan's heavy industries, such as steel, automobiles, and allied plants, the past month have stepped up production schedules to boost fuel oil markets of Michigan independent refineries.

Crude Production

Gain of 31,730 barrels recorded as Illinois advances to new peak; Oklahoma-Kansas down

PRODUCTION of crude oil in the United States during the week ended September 30 was at an average rate of 3,662,005 barrels daily. Production was 31,730 barrels more than the week before. The increase was general among all areas except Illinois, where a large increase due to utilization of new outlets established another production record.

Output was 151,305 barrels greater than the estimate of demand for domestic crude furnished by the Bureau of Mines.

Texas produced 1,496,800 barrels daily to better the average of the week before by 11,750 barrels and exceed state allowable by 8346 barrels; bureau estimate by 88,500 barrels.

California produced 609,800 barrels daily, off 7800 barrels from the previous week but still well above conservation quota and federal allocation. The former was exceeded by 11,500 barrels, the latter by 13,800 barrels.

Oklahoma output averaged 387,705 barrels daily, 9670 barrels less than the week before and 41,595 barrels under federal estimate, but above state allowable by 2755 barrels.

Illinois production with an 18,000-barrel gain rose to 344,200 barrels daily. The increase widened the gap between production and bureau prediction to 95,500 barrels and established another record mark for the state.

Louisiana produced 249,300 barrels in gaining 5000 barrels on the daily average of the preceding week and overrunning state allocation by 13,825 barrels. Output, however, was 6400 barrels less than government recommendation.

Kansas produced 157,225 barrels daily, a drop of 3275 barrels from the previous week. Output exceeded state allocation by 9520 barrels but was 9075 barrels below economic estimate.

E. W. MARLAND, pioneer Oklahoma oil man and former governor, was elected president of Marland Oil Company of Oklahoma at a directors' meeting held last week at Ponca City, Oklahoma. Marland has been acting president since the company was chartered early this year.

United States Crude Oil Production

Estimates Compiled by THE OIL WEEKLY

DISTRICT OR STATE	Bureau of Mines Estimate of Daily Demand (Sept.)	State Allowable in Sept.	BARRELS DAILY FOR WEEK ENDED Sept. 30	Sept. 23
TEXAS—				
Texas Panhandle	.....	.....	64,900	64,050
North Texas	.....	.....	84,750	83,250
West Central Texas	.....	.....	32,050	31,000
West Texas	.....	.....	257,300	255,200
East Central Texas	.....	.....	92,200	92,150
East Texas Field	.....	.....	495,050	492,800
South Texas	.....	.....	234,750	232,800
Texas Gulf Coast	.....	.....	235,800	233,800
Total Texas	1,408,300	1,488,554*	1,496,800	1,485,050
CALIFORNIA—				
Long Beach	.....	.....	45,300	45,200
Santa Fe Springs	.....	.....	26,200	27,000
Huntington Beach	.....	.....	26,100	26,700
Dominguez	.....	.....	18,500	17,900
Ventura Avenue	.....	.....	35,300	36,400
Midway-Sunset	.....	.....	49,700	51,200
Kettleman Hills	.....	.....	50,900	53,800
Wilmington	.....	.....	85,500	85,100
Others	.....	.....	272,300	274,300
Total California	596,000	598,300†	609,800	617,600
OKLAHOMA—				
Oklahoma City	.....	.....	75,725	88,050
Seminole Area	.....	.....	92,500	95,120
Fitts	.....	.....	20,550	19,500
Others	.....	.....	198,930	194,705
Total Oklahoma	429,300	384,950	387,705	397,375
LOUISIANA—				
North Louisiana	.....	.....	66,350	67,250
South Louisiana	.....	.....	182,950	177,050
Total Louisiana	255,700	235,475	249,300	244,300

DISTRICT OR STATE	Bureau of Mines Estimate of Daily Demand (Sept.)	State Allowable in Sept.	BARRELS DAILY FOR WEEK ENDED Sept. 30	Sept. 23
ILLINOIS—				
New Pools	.....	.....	336,000	318,000
Old Pools	.....	.....	8,200	8,200
Total Illinois	248,700	.....	344,200	326,200
KANSAS—				
Burrton-Haven	.....	.....	9,650	9,750
Russell County	.....	.....	24,850	22,425
Silica	.....	.....	10,050	12,000
Others	.....	.....	112,675	116,225
Total Kansas	166,300	147,705	157,225	160,500
NEW MEXICO	198,700	100,000	101,250	89,900
EASTERN STATES—				
Pennsylvania Grade	.....	.....	74,000	73,450
Others, Eastern	.....	.....	24,300	20,750
Total Eastern States	101,300	.....	98,300	94,200
MOUNTAIN STATES—				
Wyoming	70,700	.....	64,250	61,550
Montana	16,300	.....	16,200	16,550
Colorado	3,700	.....	3,700	3,800
Total Mountain States	90,700	.....	84,150	81,900
MICHIGAN	55,000	.....	67,400	68,400
ARKANSAS	50,700	64,838	65,875	64,850
Total United States	3,510,700	.....	3,662,005	3,630,275

* Daily average, considering Saturday-Sunday shutdowns, water exemptions, and exemptions at Rodessa.
† Recommendation of Central Committee of California Oil Producer's Association.

A.I.M.E. announces Galveston program

An interesting technical program has been arranged for the fall meeting of the Petroleum Division of the American Institute of Mining and Metallurgical Engineers, to be held at Galvez Hotel, Galveston, Texas, October 5-7. The program follows:

10:30 A.M. Thursday, October 5

Colloid Chemistry of Clay Drilling Fluids, by A. G. Loomis, T. F. Ford and J. F. Fidiam, Shell Development Company.

A Study of Some Phases of Chemical Control in Clay Suspensions, by Allen D. Garrison and K. C. ten Brink, Rice Institute.

Detection of Radioactive Cement in Cased Wells, by Lynn G. Howell and Alex Frosch.

2 P.M. Thursday, October 5

Properties of a Petroleum Reservoir Liquid and Its Residual with Application of the Data to Production Problems, by Kenneth Ellerts, R. Vincent Smith and A. B. Cook, Bureau of Mines.

A Method for Measuring the Amount of Entrained Gas in Drilling Fluid, by Sylvan Cromer, Louisiana State University.

Magnesium Alloys for Oil Well Casing, by J. H. Adkinson and P. E. Fitzgerald, Dowell, Inc.

The Efficiency of Various Distillate Recovery Processes, by L. S. Reid, Black, Sivalls and Bryson, Inc.

Recent Well Spacing Practice in Kansas, by J. A. Kornfeld.

9 A.M. Friday, October 6

Radial Filtration of Drilling Muds, by Milton Williams, Humble Oil & Refining Company.

Effect of Temperature on Plastering Properties and Viscosity of Rotary Muds, by H. T. Byck, Shell Development Company.

Gas Injection Operations at Louden, Illinois, by R. J. Sullivan, Carter Oil Company.

Flow of Gas-Liquid Mixtures through Consolidated Sand, by Holbrook G. Botset, Gulf Research and Development Corporation.

Ultraviolet Ray Examination of Drilling Mud, by A. L. Smith, Mid-Continent Supply Company.

2 P.M. Friday, October 6

The Dispersion of Clays and Shales by Fluid Motion, by Allen D. Garrison, K. C. ten Brink and P. B. Elkin, Rice Institute.

Phase Diagram of a Mixture of Natural Gas and Natural Gasoline Near the Critical Conditions, by D. L. Katz, D. J. Vink and R. A. David, University of Michigan.

Economics of Water Flooding by K. B. Nowels, consulting engineer and geologist.

Salt Water Disposal Methods in East Texas Field, by A. S. Rhea, Sun Oil Company and E. B. Miller, Tide Water Associated Oil Company.

Factors Affecting the Refiner's Choice of Crudes, by G. A. Beiswenger, Standard Oil Company of New Jersey.

10 A.M. Saturday, October 7

Some Problems in Proration by J. Elmer Thomas, consultant.

Value of National Gasoline Plant Operations to the Producer in Some of the Major Fields of Texas, by W. H. Woods, Gulf Refining Company.

A Comparison of Various Methods of Estimating Oil Reserves, by Roger Davis, University of Texas.

Mixing of Gases in Porous Media, by R. L. Huntington, University of Oklahoma.

Pipe line companies have adopted safety

The numerous pipe line companies that operate in excess of 115,000 miles of underground transportation systems in the United States have kept stride with other branches of the petroleum industry in the development of the safe practices and accident prevention work, according to Charles A. Miller, vice chairman of the pipe line committee of the Petroleum Section of the National Safety Council, which is to hold its annual convention in Atlantic City, New Jersey, on October 16-20.

From a questionnaire sent out recently to 49 pipe line companies or systems and replied to by 32 organizations, with a total trunk line mileage of 53,363 miles and employing in the neighborhood of 19,000 men scattered over 24 states, the following pertinent data with regard to accident prevention work carried on by these companies has been gathered, Miller points out:

Twenty-three systems report formal safety organizations supervised by safety engineers, safety inspectors, or personnel and safety departments.

Twenty companies carry on the safety work through committees, consisting mainly of foremen and employees, meeting once each month.

Twenty-seven systems use safety bulletin boards, with posters or bulletins secured from the usual sources and changed weekly or bi-weekly.

Twenty-six companies carry on the usual safety inspections by inspectors, supervisors, safety engineers, or superintendents.

First aid training is conducted by 21 companies, 13 of which report that 100 percent of their employees have been trained, while the remaining systems have trained 82 percent, or a general average for all companies of 93 percent. This would indicate that approximately 17,500 employees of the pipe line companies reporting, have received first aid training.

A considerable number of the companies hold safety rallies or other gatherings to which the families of employees are invited, and do not confine their activities to industrial safety, but include home and public accident prevention programs as well.

Many of these pipe line systems hold enviable safety records, which indicates beyond contradiction that their efforts in accident prevention work have brought the anticipated and desired results, and in a large measure these accomplishments can be traced to the exceptionally favorable and active participation of executive management in the pipe line accident prevention work.

Coastal refiners report larger gasoline stocks

The 10 independent refining companies composing the Gulf Coast Refiners Association have reported an aggregate slight increase in saleable motor fuel in the week ended September 23, the total having risen to 338,300 barrels from 303,889 barrels a week previously.

Stocks of aviation gasoline available for sale meanwhile declined further to 103,629 from 151,314 barrels a week before.

Unsold stocks of high octane blending naphtha were reported to have remained unchanged at 68,559 barrels.

Unsold kerosene stocks dropped from 101,048 to 55,489 barrels.

No unsold stocks of gas oil or Diesel oil were reported. Unsold stocks of No. 5 fuel oil totaled 105,500 barrels on September 23, compared with 84,565 barrels a week before. Stocks of Bunker C fuel available for sale were reported at 19,286 barrels.

Crude oil runs to stills by the group totaled 590,688 barrels for the week, or 84,384 barrels daily, as compared with 518,297 barrels or 74,042 barrels daily in the previous week.

East Texas A.P.I. meets October 10

The first fall meeting of the East Texas Chapter of the American Petroleum Institute will be held at the Kilgore High School auditorium at 8 p. m. Tuesday, October 10.

An interesting program has been arranged, including a speaker furnished by the New York office of the American Petroleum Institute, who will discuss "The Oil Industry and Its Relation to the Public." Woody Erwin, of National Tank Company, will discuss "The Conservation of Crude Oil Gravity in the Field." J. R. D. Eddy, director of Industrial Education for the State of Texas will then discuss new and additional courses offered as vocational training in East Texas.

The regular A. P. I. dinner at the Kilgore Hotel will be held immediately preceding the meeting as usual, beginning promptly at 6:15 p. m.

S.A.E. fuel division to meet in Tulsa

Brigadier General George H. Brett and Colonel A. W. Herrington will be the chief speakers at the meeting of the Fuels and Lubricants Division of the Society of Automotive Engineers, scheduled for November 2-3 at the Mayo Hotel, Tulsa, Oklahoma. The former is chief of the Material Division, U. S. Aviation Corps, and will speak on "The Present Trend in Design and Size of Military Aircraft." Colonel Herrington is president of Marmon-Herrington Company and an authority on foreign armaments.

According to B. E. Sibley, Continental Oil Company, and general chairman of the meeting, the program is of unusual and timely interest. Other papers already scheduled include, "Oil Industry Power," by Prescott C. Ritchie, Waukesha Motor Company; "Vaporization Characteristics of Motor Fuels," by Alden, Trimble and Blair, Phillips Petroleum Company; "Power Applications for the Movement of Earth," by J. M. Cavies, Caterpillar Tractor Company; and "Hypoid Lubricants," by C. F. Prutton, Case Institute, Cleveland, Ohio. A feature of the November 3 evening session will be a debate between engineering students of Kansas State University and the University of Oklahoma on the subject: "Resolved: That V-Type Engines Are to Be Preferred to In-line Engines for Passenger Car Equipment."

This is the third consecutive year that this anual meeting has been held in Tulsa and interest in it has been growing steadily among oil men of this region who have little opportunity to take part in automotive discussions. Because of this fact the sessions are open to all petroleum and production engineers and a special invitation to participate is extended to them.

Aside from Mr. Sibley, other members of the Arrangements Committee are: W. F. Lowe, Natural Gasoline Association, local chairman; J. V. Brazier, Barnsdall Refining Company; T. J. Schuetz, Braden Winch Company; C. A. Tangner, Diesel Power Company; and C. S. Hanson, Phillips Petroleum Company.

WEEK'S DRILLING HIGHLIGHTS

Montana

A drilling record for the state was set when a 2600-foot Cut Bank well was put on production 11 days after spudding. An Albert Dome wildcat in Carbon County chalked up a heavy flow of gas at 247 feet. The first oil completion in 1939 for Pondera field was reported.

Michigan

A half mile east of Kent County field an outpost showed 500 feet of oil in casing; a wildcat 2 miles southeast of the field flowed a small amount by heads. Both were Traverse lime tests.

Texas Gulf Coast

Anchor prospect, Brazoria County, was converted into the district's second 10,000-foot oil field. A northeast outpost at League City, Galveston County, is testing a new sand. So is a south outpost at Clear Lake, Harris County. Abandoned outposts were results of extension attempts at Friendswood and Mykawa fields.

Illinois

Hamilton County may get its first oil field, McClosky lime saturation having been encountered at 3450 feet in a wildcat there. Substantiating tests were performed at the two White County wildcats which last week indicated new fields. The Niagaran lime section of Sandoval appears to have been extended ½ mile.

Indiana

Knox County, where average initial production figures are very small, may have its first sizeable well—a Vincennes Township test is bailing 4 barrels hourly.

Comparison of Permits Granted for New Wells

STATE	Week Ending Sept. 30	Total this Mo.	Total this Year	Total this Date Last Year	1938 Year Total
Arkansas	6	22	177	188	247
California	18	105	783	940	1,146
Louisiana	26	141	1,004	965	1,214
Kansas	36	127	1,132	1,200	1,453
Michigan	36	163	1,069	691	953
N. Mexico	* 23	49	105	.....	.....
Oklahoma	32	145	1,515	1,558	1,978
Texas	184	766	7,703	10,080	12,369
Total	361	1,518	13,488	15,622	19,360

* Data for new Mexico prior to August 1, 1939 not available.

Southwest Texas

Three shallow strikes lined up a trend 100 miles long in Goliad, Victoria and Jackson counties for development. First crude oil production in LaGloria, Jim Wells County, was furnished an extension and a new sand. Efforts are under way to complete an outpost a mile southeast of Wade City pool, same county. Seven miles southwest of Port Isabel, Cameron County, a wildcat blew out at 6673 feet.

Kansas

Extensions were recorded for Bemis, Hittle and Burrton pools. The extension of Albert, Barton County, made a potential of 163 barrels from Reagan sand. Five miles southeast of Gardner pool a shallow gas strike was recorded. An outpost of Stumps pool, Ellsworth County, had an oil show. Coralena and Trapp pools apparently were joined.

Oklahoma

Lincoln County had two Prue sand discoveries, one near Cushing and one southwest of Davenport. Near Spaulding in Hughes County a wildcat filled 1800 feet with Booch sand oil. A well in a new zone extended Cement a mile. Markers were being logged high on Calumet structure, Canadian County.

North Texas

Hull-Silk, Archer County's deep-lime area, is rivaling K-M-A for activity leadership in the district. Increased activity in North Texas that has been in prospect is endangered by lower allowables, as contemplated line extensions which are a contingency probably will be deferred.

West Texas

Still without pipe-line outlet, Seminole, Gaines County, has 16 wells, the latest of which emphasizes importance of the area by flowing 767 barrels in 17 hours. A second Permian producer on the west edge of North Cowden, Ector County, seems assured.

South Louisiana

LaPlace, a geophysical prospect, may soon be an oil field if indications are carried through. The third Wilcox field for the area is in prospect as testing is under way in that formation at Bancroft.

Summary of Wells Completed in the United States Week Ending September 30, 1939

	Completions	Oil Wells	Gas Wells	Failures	Initial Production	Total 1939	Total this Date 1938
Alabama	....	....	....	....	.....	1	2
Arizona	1	....	....	1	.....	1	....
Arkansas	3	3	....	....	1,091	180	171
California	14	10	....	4	8,369	799	968
Colorado	....	....	....	....	.....	15	6
Florida	....	....	....	....	.....	....	....
Georgia	....	....	....	....	.....	1	1
Illinois	73	48	....	25	14,783	2,764	1,076
Indiana	13	6	2	5	2,355	172	96
Kansas	57	40	5	12	163,005†	1,052	1,301
Kentucky	7	4	....	3	265	497	592
Louisiana	29	21	....	8	7,177	809	827
Michigan	30	23	1	6	10,190	1,099	693
Mississippi	....	....	....	....	.....	11	11
Montana	4	4	....	....	220	110	57
Nebraska	....	....	....	....	.....	1	1
New Mexico	14	11	1	2	2,755	479	409
New York	18*	18*	....	....	37	448*	530*
North Dakota	....	....	....	....	.....	....	1
Ohio	25	2	18	5	52	719	734
Oklahoma	48	38	2	8	8,976	1,534	1,663
Pennsylvania	31*	30*	1	....	27	1,187*	1,705*
South Dakota	....	....	....	....	.....	....	....
Tennessee	....	....	....	....	.....	....	2
Texas	156	105	11	40	91,687	7,215	9,733
Utah	....	....	....	....	.....	....	3
West Virginia	17	4	11	2	164	409	528
Wyoming	2	2	....	....	540	106	80
Total this week	542	369	52	121	311,696	19,596	21,089
Total last week	489	315	67	107	185,566	19,054	20,553
Total this year	19,596	13,331	1,448	4,817	13,752,174	....	....

† Includes several potentials calculated by "draw-down" method.
* Includes water-input wells.

Oklahoma Fields

Lincoln County gets two Prue sand discoveries.

Hughes County Booch sand strike swabs 150 barrels.

Oklahoma Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
Carter—		
Pure, Noble 1, c ne se 35-3s-1e....	100	4454
Ball et al, Crickenberger 2, ne se sw nw 20-3s-2w	*	88
Creek—		
Carpenter et al, Bovaird 1A, swc ne 9-16n-11e	*	2022
Sinclair Prairie, Jones 29, c w½ se nw 3-17n-7e	70	2581
McAdams et al, McSoud 2, se nw sw 31-17n-10e	70	2720
Weimer et al, Tiger 2, sw ne sw 31-17n-10e	10	2722
Link, Haggard 7, nw nw se ne 3-18n-7e	12	1443
Morran et al, Morrison 12, se nw sw 8-18n-11e	4	1732
Johnson Refg. Co., Zickafoose 9, ne se nw 1-19n-9e.....	20	2046
Garfield—		
Sinclair Prairie, Kistner West 42, nw ne sw nw 19-22n-3w.....	14	1164
Jackson—		
Matthews et al, James 2, nw sw nw 2-1n-20w	50	1566
James 3, se nw nw 2-1n-20w....	50	1572
Gulf, Barrett 1, ne nw sw 10-1n-20w	70	1583
Burnham, Guyrman "B" 1, sw ne sw 14-1n-20w .....¶	0.32	†360
Ray, Amelia 2, nec 6-1s-19w.....	99	2578
Kay—		
Cells et al, Wolfenberger 1, nwc se 9-27n-4e	*	1072
Lincoln—		
Harper et al, May 1, nw sw ne 22-14n-6e	33	3075
McIntosh—		
Turner et al, Porter 2A, c nw sw 3-12n-14e ..... ¶	0.5	815
Muskogee—		
Pet. Grub Stakers, Anthis 2, nw nwc ne 21-13n-19e	*	788
Parks, Hilderbrand 8, se se ne se 17-14n-19e	*	781
Hash, Barnett 4, se se nw ne 8-15n-15e (otd 1592 ft)	25	1632
Barnett 5, 200 ft n cnl sw ne 8-15n-15e (otd 1603 ft).....	5	1649
Okfuskee—		
Snyder et al, Wind 6, 200 ft w c s½ ne 35-11n-9e	80	1469
Oklahoma—		
I. T. I. O. Co,, Watters 8, ne sw ne 25-11n-3w	89	4098
Okmulgee—		
Briscoe, Bosen 1, 130 ft s c s½ se sw 36-14n-12e	7	1690
Francis, Adams 4A, nw se nw nw 33-15n-14e	15	1516
Osage—		
Tide Water et al, 1, nec se 23-26n-4e	50	3171
Payne—		
Magnolia, Cain 4, c e½ ne sw 12-17n-1e	114	4854
Texas, Longan 3, c w½ ne nw 12-17n-1e 2	010	4858
Pontotoc—		
Konawa, Masters 4, sec sw 14-2n-7e	80	1425
Moore, Ingram 3, nw sw ne ne 22-2n-7e	37	1337
Simpson-Fee, Bates 1, sw se nw 26-2n-7e 2	647	3980
Moore, Brown 4, ne se sw 34-2n-7e	93	1857
Brown 5, 60 ft s ne se sw 34-2n-7e	74	1848
Alma, Youts 3, nw sw sw 28-7n-5e	600	4112
Portable, Boyd 3, se ne se 29-7n-5e	400	4141
Alma, Rhodd 2, nw se sw 32-7n-5e	60	4146
Pace, Hale 1, c sw ne 31-10n-5e..	840	4485
Seminole—		
Sunray, Millsap 2, swc 7-6n-6e....	155	3823
Eagle, Ryan 1, nec sw 6-6n-8e....	454	4230
Deaner, Wood 2, nec se 33-7n-6e..	300	2880
Thompson, Ferguson 2, nec sw 7-7n-8e	*	4266
Rogers et al, Hawkins 1, ne se se 36-8n-7e	6	3550
Magnolia, Anderson 2, nwc se 18-9n-6e (otd 4258 ft)	100	3160
Stephens—		
Sunray, Hefner 1, sec nw 12-1n-5w (otd 3825 ft)	117	5585
McAllister et al, Wade "B" 3, sw ne sw ne 11-2s-8w	16	1534
Minnich, Stafford 1, sw se ne sw 4-3s-5w	*	1110
Wagoner—		
Smith, Hill 1, sw ne ne 30-17n-18e	*	1172

* Failures; † Junked; ¶ Million cu. ft. gas.

Tulsa.—Two new pools were opened in Oklahoma to spur field activity. Southeast of Cushing a nitro shot in Prue sand increased the flow to 75 barrels daily in a Lincoln County discovery. Another wildcat 2½ miles southwest of Davenport, also in Lincoln County, cored 27 feet of saturated Prue sand to indicate a producer. A Booch sand discovery opened a new pool for Hughes County, swabbing 150 barrels in initial 24-hour gauge.

After a 140-quart shot in Prue sand at 2865 to 2904 feet, Murray and Griffey's Burke 1-A, SE SW NE 20-17n-6e, 3 miles southeast of Cushing, was estimated good for better than 75 barrels daily and gas volume increasing to 3,000,000 cubic feet. Pay was topped at 2850 feet and drilled to 2910 feet. Additional tankage is being erected.

Southwest of Davenport pool, Lincoln County, Portable Drilling Company's Nickel 1, SEc 17-14n-5e, indicated a good pool opener from Prue sand. Sand was topped at 3475 feet and found highly saturated from 3525 to 3552 feet. Seven-inch casing was cemented at 3509 feet prior to drilling in.

Stanley Rogers opened a new area in Hughes County at Scott 1, SE SW NW 23-6n-8e, 3 miles southeast of Spaulding. Booch sand was penetrated at 2646-76 feet and pipe set at 2649 feet. Hole filled 1800 feet with oil when plugs were drilled and it bailed 150 barrels of oil in 24 hours. Location is on a spread of 1200 acres, all covered by individuals. Rogers may shoot the sand before final completion.

Cement Extended Mile

Cement pool, Caddo County, was extended a mile northwest, as well was opening a new sand zone for the area. Ray Stephens, Incorporated, had a 60-barrel producer at De Heck 1, NWc SE 21-6n-10w, from sand at 3303 feet to 3315 feet. First shallow zone for the pool was found around the 2100-2200-foot level and resulted in good wells averaging 200 barrels. In the same county, Sinclair-Prairie Oil Company's German 1, southwest of Carnegie, was drilling around 6700 feet after encountering several shows of black oil above the Kinderhook.

On the north edge of Coyle pool, Payne County, The Texas Company's J. S. Graham 2, C E½ SE SE 11-17n-1e, flowed 212 barrels through casing in 24 hours while drilling in Wilcox sand at 4903 feet.

South of Ramsey pool, Murray and Griffey et al's Davis 1, SEc 24-18n-1e, topped first Wilcox sand at 4940 feet and came out of the sand at 4959 feet with only a watery core. Second sand was being drilled and if unproductive, hole will be plugged back to test a show of oil in Hunton lime at 4725 feet.

Sinclair Prairie Oil Company's Ford 1, SW NW SE 12-17n-1w, east edge Langston pool, Logan County, deepened from 5087 feet to 5125 feet in the Marshall zone to fill the hole 2000 feet with oil. A swabbing test is being made. West of Lovell area, Logan County, Jones Associated Oil Company and Kerr-Lynn Oil Company's Ridgon 1, C W½ NE SE 29-18n-4w, topped Viola lime high at 5900 feet and looms for a Wilcox sand producer. The test is checking on a par with Stanolind Oil & Gas Company's discovery well in SWc NE 20-18n-4w. The northward trend of Meridan pool may be defined at Sinclair Prairie Oil Company's Crews 4, NE NW NE 27-16n-1e, which swabbed and flowed only 75 barrels in 24 hours from first Wilcox sand topped at 5179 feet and drilled to 5201 feet.

Canadian County's wildcat on the Calumet structure was looking favorable on upper horizons: W. R. Ramsey et al's Mansfield 1, C NW NE 16-14n-9w, topped the Pawhuska at 4250 feet, Carmichael at 4950 feet, Oread at 5200 feet, and was drilling below 6225 feet. It is checking better than 1300 feet higher than Denver Production and Refining Company's deep test at Binger pool, Caddo County.

Southeast of St. Louis and north of Grayson pool, Seminole County, T. E. Iglehart et al completed Kennedy 1, NWc SW 1-6n-5e, pumping approximately 9620 barrels in 10 days of testing and about the same amount of water. West of the test, Inglehart et al's Curley 1, NE SE SW 4-6n-5e, was drilling plugs in Viola lime at 4021 feet, total depth being 4146 feet. Campbell 1, SW NE SW 4-6n-5e, was rotating below 3975 feet.

A mile north of East Seminole pool, York Petroleum Company et al's Cromwell-Harber 1, NEc NW 6-9n-7e, had 2500 feet of fluid in the hole from a plug back at 3740 feet in Gilcrease sand, topped at 3720 feet. Cromwell sand was semi-saturated at 3751-66 feet. A wildcat failure 1½ miles north of Hazel pool, Seminole County, was reported. Sands Petroleum Company's Misselder 1, NWc SE 13-7n-5e, found dry Earlsboro sand at 3120 feet and shut down operations at 3144 feet.

Tuskogee Pool Defined

The southern edge of Wilcox structure in Tuskogee pool, Creek County, was defined at J. R. Higgins et al's Worley 2, SEc SW 34-14n-10e. Wilcox sand showed only water from 3298 feet to 3328 feet. A show of oil in Misener sand at 3199 to 3206 feet will be tested. Same operators Worley 1 made a good producer from both sands.

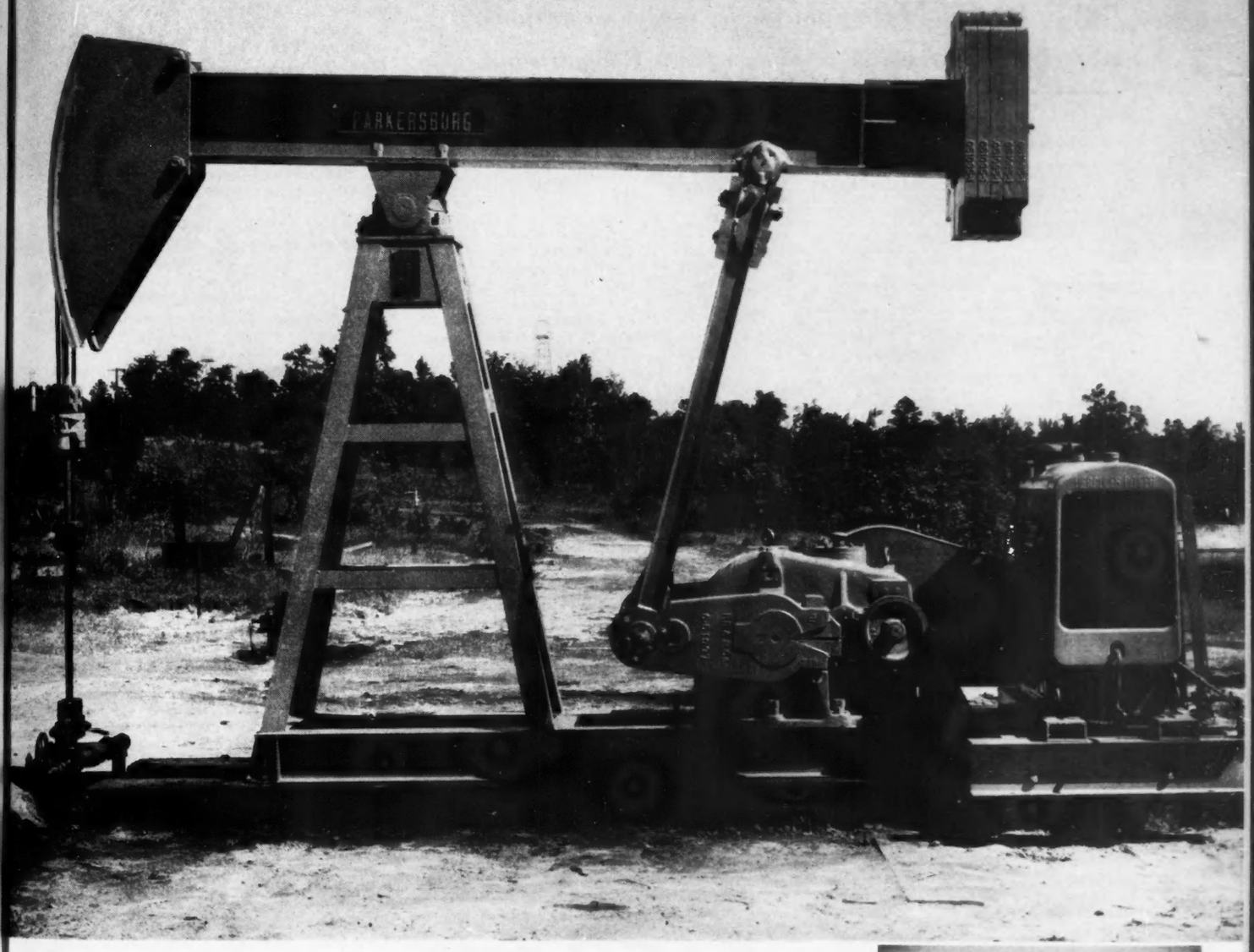
Clyde Ross et al's Hardy 1, SEc NW 21-7s-15e, 3 miles west of Bluff, set pipe to test a show of oil and gas at 1481 feet. This may be a spot opener for Choctaw County.

Sinclair Prairie Oil Company's Ward 1, SEc 30-7n-1e, near Lexington in Cleveland County, was bailing at 5200 feet with only a small show of oil and no gas in the Simpson zone. Anderson-Prichard et al's Oil Company's Geis 1, C NE SW 15-18n-9w, 4 miles northwest of Loyal, Kingfisher County, hit a show of 250,000 cubic feet of gas at 7350 feet in lime and was drilling below 7600 feet.

Berry Brothers' Mount 1, NW NE NE 1-13n-10e, 2 miles southeast of East Tuskogee pool, Okfuskee County, plugged the hole at 3327 feet in watery Wilcox sand.

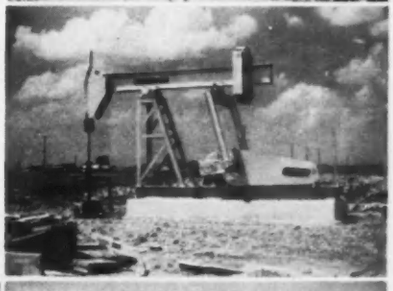
Northeastern Oklahoma was active with six starts being reported.

THEY'LL CONTINUE TO PAY DIVIDENDS



LONG AFTER THE PRICE IS FORGOTTEN

It is significant that once an operator turns to quality-built Parkersburg Pumping Units he doesn't change back. It takes but little experience with these smooth-running, trouble-free units to find that the savings in down-time and repairs pay for them within a reasonable period. But, more important than that, their low operating cost helps to materially hasten the "pay-out" of your wells. Still more important is the fact that the dependable, long-life service of Parkersburgs means they'll continue to pump back dividends long after the investment is forgotten.



THE PARKERSBURG RIG & REEL COMPANY

PARKERSBURG, W. VA.

DALLAS HOUSTON TULSA ST. LOUIS LOS ANGELES NEW YORK

D-11-39

Kansas Field Developments

Bemis, Hittle and Burrton pools receive extensions.

Albert pool extension produces from Reagan sand.

Kansas Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
Barton—		
Day et al, Feltes 1, sec ne 14-16-12w	*	3342
Shell, Schneider 4, ne nw ne 2-16-14w	852	3326
Stanolind, Stueckemann 9, sw nw se 11-20-11w	1663	3291
Cities Service, Schlessiger 1, c e½ se se 13-20-12w	2931	3301
Simpson et al, Brown 1, c w½ nw se 31-20-12w	*	3650
Butler—		
Rex et al, McKaig 1, sw nw ne 24-28-6e	*	2838
Cowley—		
Gulf, Raymond 1, nec sw 33-30-4e	8214	3273
Barnett et al, Waite 7, nw sw sw 21-31-4e	1745	3378
Sinclair Prairie, Gardener "A" 1, sw nw se 16-32-5e	495	3095
Ellis—		
Shell, Rumsey 22, sw se ne 23-11-17w	14,774	3439
Bay, Barbier "A" 1, nec nw 1-11-18w	10,008	3589
Central Petroleum, Hadley 3, nw ne se 12-11-18w	*	1095
Hadley 6, sw ne se 12-11-18w	*	1092
Darby, Hadley "B" 1, c n½ ne nw 13-11-18w	92,000	3358
Republic, Moran 1, c nw se 24-15-20w	*	3764
Ellsworth—		
Central et al, Schepmann 1, c s½ sw nw 27-17-10w	*	3339
Greenwood—		
Barker, Gregg 1, sw nw se 35-25-12e	¶0.5	1660
Harvey—		
Drillers, Bott 1, c w½ nw sw 7-23-3w	146	3381
Johnson—		
OK Supply et al, Kanabe "B" 2, sw se sw ne 15-14-22e	8	826
Kanabe "A" 3, ne se sw ne 15-14-22e	10	826
Kanabe "B" 4, se swc ne 15-14-22e	15	820
Kiowa—		
Sinclair Prairie, Price 1, 110 ft s nwc sw 22-28-20w	*	5800
McPherson—		
Shell, Sellers 2, nec 31-19-1w (otd 2957 ft)	220	2989
Pratt—		
Skelly, South Maxedon 1, cwl nw se se 25-27-11w	772	3458
Skelly, Lakin 1, c ne 36-27-11w	¶21.5	4068
Atlantic et al, Hacker 1, c w½ se sw 11-27-13w	*	4364
Skelly et al, Allbritten 1, c nw 1-28-11w	¶29.75	4212
Rice—		
Continental, Hamilton "A" 2, swc nw 19-18-7w	2549	3128
Gulf, Ames 3, cwl nw ne nw 6-18-10w	163	3290
Transwestern, Roesler "B" 2, sw nw nw 6-18-10w	615	3102
Shell et al, Saint 2, 110 ft n sec 10-19-9w	150	3262
Harwood, Cramm 2, sw se se 15-19-9w	102	3241
Skelly, Bernstorf "B" 1, c s½ nw sw 23-19-10w	400	3290
Central, Dippel 1, c n½ ne se 27-19-10w	96	3202
Continental, Groth 7, swc 32-20-7w	1211	3338
Shell, Maughlin 1, ne nw se 11-20-8w	¶12.5	3294
Darby et al, Oden 1, 178 ft s se nw nw 5-21-7w	*	3381
Continental, Hauschild 1, nw ne sw 14-21-7w	*	3395
Russell—		
Skelly, Opdycke 8, c s½ ne sw 29-14-13w	988	2933
Texon, Lipprand 2, 100 ft e se nw nw 35-14-13w	1200	2874
Aylward, Holl 6, sw se sw 22-14-14w	3046	3085
Stanolind, Krug "A" 3, cwl sw se ne 27-14-14w	1513	2997

Wichita.—Extension of Bemis, Hittle and Burrton pools and discoveries of 2 gas pools highlighted activity the past week. Trapp and Coralena pools, Russell County apparently were joined.

Carl Hipple et al's Frederick 1, NWc SW 17-23-3w, ¼ mile northeast of Burrton pool, Harvey County, drilled to the chat at 3371 feet, top being 3280 feet, and made a potential of 1330 barrels daily. Gas was estimated at 7,000,000 cubic feet. Formerly this well was completed as a gasser at an upper pay zone. Hipple's Howell 1, SWc NE 17-23-3w, a north offset, was moving in materials, and his Martindell 1, NW NE NE 18-23-3w, a west offset, was staked.

The rapidly expanding Bemis pool, Ellis County, was again extended. Cities Service Oil Company's Callahan 2, NWc SE 24-11-17w, ¼ mile east of production, was completed for a large well, rating 3500 barrels daily from Arbuckle lime at 3449 feet. The company staked Calahan 3, SWc NW 24-11-17w, and rotary rig was moved to location.

Jock Garden gave Hittle pool, Cowley County, a southern extension at Tonkinson 1, NE SW NW 28-31-4e. Arbuckle lime was topped at 3331 feet and penetrated only 3 feet as the hole filled with oil. Production test will be taken. North of the pool, Roth Oil & Gas Company made a well at Gretsinger 3, SW NE NE 15-31-4e. From 3466 feet in Arbuckle lime the well pumped 10 barrels of oil and 4 barrels of water in 24 hours. Pryor, Lockhart and others were testing Arbuckle lime at Haney 1, CEL SE NE 8-33-6e, 2 miles southeast Werner gas pool. Five-inch casing was landed at 3495 feet, immediately above the pay.

The extension test of Albert pool, Barton County, made a potential of 163 barrels from Reagan sand at 3585 feet after a 40-quart shot in the sand section. However, a mile northeast of oil and gas production in the area Shell Oil Company's Schnieder B-1, C NW 16-18-15w, was a failure at 3628 feet in Arbuckle lime with no shows of either oil or gas.

Ask ten-acre spacing for Konawa pool

Tulsa.—Ten-acre spacing has been requested by J. F. Smith for producing area west of Konawa pool in Pottawatomie and Seminole counties. Expected acreage to be proven lies in Sections 3, 10, north half of 15 in Seminole County and Sections 4, 9, north half of 16 in Pottawatomie County. Pay is Simpson dolomite and ranges 4071 to 4232 feet.

Company, Well and Location	Init. Prod. Bbls.	Depth
Central, Rouback "A" 8, nwc ne 15-14-15w	2472	3265
Wolf Creek, Rouback "B" 3, se ne nw 15-14-15w	2414	3258
Gulf, Rein 1, c s½ sw ne 8-15-13w	571	3201
Stanolind, Roesner 3, c n½ sw sw 9-15-13w	636	3064
Coralena, Sellens 9, se ne nw 17-15-13w	4755	3200
Southern, Meharg 5, se ne ne 18-15-13w	201	3254
Hall, Landon 4, sec 11-15-14w	2085	3345
Saline—		
Cling et al, Erickson 1, nec 28-16-3w	*	3375
Stafford—		
Stanolind, Hays 9, c n½ ne se 11-24-11w	671	3763
Moore, Steward 3, c s½ ne sw 12-24-11w	768	3751
Stanolind, McComb 3, c s½ nw sw 12-24-11w	1358	3757
Sinclair Prairie, Krey 12, cwl sw ne ne 14-24-11w	30	3785
Continental, Keller 1, nw sec 15-24-13w	1171	4116
Woodson—		
Turner et al, Tipton 1, sw se nw sw 32-25-14e	¶0.28	687

* Failures; † Junked; ¶ Million cu. ft. gas.

Shallow Gas Strikes

A shallow gas sand paid off at Joe Willinbring et al's Raney 1, NWc SW 17-15-23e, 5 miles southeast of Gardner pool and 7 miles north of Paola pool. Drilled to 915 feet, and plugged back to 610 feet, it made 200,000 cubic feet of gas daily. Six miles south of Osawatomie, Miami County in southeastern Kansas, Davis Gas Corporation completed at 62,000 cubic feet gas well and an offset test made more than 1,700,000 cubic feet of gas from shale at 523 feet. Twelve additional wells have been contracted for. Considerable gas is known to exist in this area, off the Nemaha granite ridge and on a northeast-southwest trend from Wyandotte County, Kansas, to Pontotoc County in Oklahoma.

A well may extend Stumps pool, Ellsworth County, a ½ mile northward. Mid-Continent Petroleum Corporation's Dougherty 1, SW SE NW 33-17-10w, topped Arbuckle lime at 3249 feet and drilled to 3275 feet to show for a barrel of oil an hour. On deepening to 3285 feet more saturated pay was found and a new test was being made.

Join Coralena and Trapp

Coralena and Trapp pools, Russell County, were apparently jointed. A ½ mile between the pools, Gulf Oil Corporation's Everett 1, C W½ SW NE 20-15-13w, filled 2000 feet with oil from Arbuckle lime at 3317 feet and penetrated only 3 feet. Tankage is being erected prior to acidizing the well before final testing.

The largest producer for South Sittner area, Stafford County, was brought in at Stanolind Oil & Gas Company's Seifkes 5, CNE 3-22-12w, being completed for 2304 barrels daily from Arbuckle lime at 3598 feet, following a 2000-gallon acid treatment job. The producer is a location west of Seifkes 2, a 1753-barrel well, and about ¼ mile southeast of Seifkes 4, a dry hole in NE NW 3-22-12w.

Three miles southwest of Fox-Bush pool, Butler County, an important trend wildcat was staked. A. D. Allison and W. G. Talbott moved in a rig for Zink 1, SE NE 32-29-5e, on the northeast-southwest trend of the Fox-Bush pool to the prolific Hittle pool of Cowley County. This area has been a hot-spot since the recent Bartlesville strike by Ash and Hershey at Manny 1, NWc SE 33-28-5e, which was good for 75 barrels daily from that sand at 2779 feet.

Pospishel pool, Barton County, drew

its second test since discovery. Transwestern Oil Company and Iron Drilling Company staked Pospishel 1, NW SW 21-17-15w, an east offset to the 231-barrel discovery well.

Louisiana October allowable 258,504 barrels

The Louisiana Conservation Commission increased the October allowable for Louisiana a total of 23,029 barrels over September, setting the October figure at 258,504 barrels. Of this South Louisiana was alloted 192,722 barrels as compared to 172,987 barrels for September. North Louisiana was boosted to 65,782 barrels as compared to 62,488 barrels in September. The North Louisiana allowables were distributed as follows: Cotton Valley, 7875 barrels with 3500 barrels alloted to Holloway (Travis Peak) wells and 5285 barrels to Lower Marine "D" and "E" (Bodcaw sand) wells; Lisbon, 6000 barrels; Shreveport, 4497 barrels; Rodessa, 25,500 barrels; and remaining fields, 21,000 barrels.

Arkansas allowable for October same as September

The Arkansas Oil & Gas Commission decided at a hearing at Magnolia, Arkansas, last week to leave allowables for prorated fields of that state at the same figures as for September. Allowables for October in prorated fields follow: Atlanta, 450 barrels; Buckner, 2400 barrels; Village, 1000 barrels; Lewisville-Stamps, 1050 barrels (first time this field has been prorated); Magnolia, 15,000 barrels; Schuler (Jones sand), 15,000 barrels; and Schuler (Reynolds lime), 2400 barrels.

Two lines to take gas from Lake Bisteneau

Arkansas-Louisiana Gas Company is laying a 14-inch line from Section 36-17n-10w, Bienville Parish, Lake Bisteneau gas field to connect with its Monroe-Shreveport trunk line near Dubberly, Webster Parish, in Township 18 north, Range 8 west. Union Producing Company will lay a similar line at once from Lake Bisteneau, with a booster station in Section 31-17-10, to connect with its Koran-Elm Grove gas line and then through Sibley to Dubberly, Township 18 north, Range 8 west to connect with the gas-distillate Glen Rose wells in the Dubberly field which have been without a pipe line outlet since the discovery of this field three years ago.

This gas from Lake Bisteneau and Dubberly will be turned into a line to be laid via the Sugar Creek gas field, Claiborne Parish, Township 19 north, Range 5 west, to connect with Union Producing Company's 20-inch line near the Lisbon field in Township 20 north, Range 5 west. The new lines are to furnish gas for Union Producing Company's trunk lines into the southeast to supplement the supply which is dropping in the Jackson, Mississippi, gas field.

Southern Natural Gas Company is planning an 18-inch gas line from its Monroe-Birmingham trunk line to the Tinsley Dome field in Yazoo County, Mississippi, for furnishing gas to this new oil field in Mississippi.

Knox County test bails four barrels per hour

Evansville, Ind.—A. W. Cherry, Barron Kidd and A. C. Thomas' Charles Schwab 1, 330 feet from the north line and 330 feet from the south line, Lot 44, Division C, Vincennes Commons, 2n-10w, Vincennes Township, Knox County, was bailing free oil at the rate of 4 barrels an hour from the upper McClosky, topped at 1817 feet. The wildcat was having 5-inch casing set to the producing horizon, and was scheduled for deepening. It promises the first sizeable well in Knox County, previous trys resulting in two small producers and a number of dry holes.

Two new starts and a dry hole comprised wildcat developments. In Gibson County, Roberts Bros.' Keck 1, NE NE NW Section 34-3s-14w, was a location, while Paul Doran's Mauck-Benson 1, NW SE NW Section 27-2s-12w, had derrick up and pits dug. In Posey County, Ray Ryan & Morgan Brown's Wolf 1, C SE SW Section 30-7s-14w, topped the Ste. Genevieve at 2779 feet and was abandoned at 2937 feet.

Indiana Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
—Daviess County—		
Prairie O&G Co., Allison 1	*	1182
Gibson County—		
Tide Water Associated, Kelly 1	150	3019
Hollandsworth & Bander, Hughes-Cooper 6	115	2502
Midwest Dev. Co., Wirth 2	¶.15	235
Taylor et al, Epperson 1	*	3540
Harrison County—		
W. B. Grove, Jacob 1	*	125
Jay County—		
Larapaul Oil Co., Lander 1	10	1100
Posey County—		
Superior Oil Co., New Harmony Realty 7	1000	2215
New Harmony Realty 7	480	2212
Somers & Egan, Keck 1	600	2515
Ryan & Brown, Wolf 1	*	2937
Spencer County—		
Kentucky Natural Gas Co., Axton 1	¶10.75	897
Sullivan County—		
A. S. Reed et al, Higbee 1	*	800

West Virginia Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
Cabel County—		
Bowen Gas Co., Childers 3	¶.28	3320
United Fuel Gas Co., Adkins 4847	¶.15	3162
Calhoun County—		
Hope Nat. Gas Co., Lockney 7847	¶.08	2237
Clay County—		
Thompson Gas Co., Thompson 16	¶	1909
Doddridge County—		
D. W. Gribble, County Inf. 1	*	2850
Gilmer County—		
Hope Nat. Gas Co., Beall 1	¶.20	1950
McCall Dr. Co., Napier 1	¶.30	2138
Kanawha County—		
G. L. Cabot, Putnam 2	¶6.10	5057
Owens-Libby-Owens, Parcell 1	¶3.18	5227
F. S. Supplee 1	¶1.25	3877
Lincoln County—		
Russell Gas Co., J. Coooper 3	¶.24	3825
Pleasants County—		
G. S. M. Powell Farm Oil Co., Carder 3	150	2010
Ritchie County—		
Mole Hill O&G Co., Darnell 1	8	1142
Patterson & Pope, Patterson 9	¶.09	1994
Roane County—		
Rodgers Prop. Co., Red Perot 1	5	1834
Reed et al, Hughes 1	*	1812
Wirt County—		
W. C. Patterson, Robinson 26	1	705

Kentucky Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
Breckenridge County—		
Calvert et al, Cooper 1	*	596
Butler County—		
J. C. Miller, Cook 1	10	400
Daviess County—		
Master Oil Co., Hansford 1	200	1455
Hupp et al, Akin 2	50	1479
Finwell Dr. Co., Sloane 2	*	1350
Henderson County—		
Yingling et al, Nunn 4	*	2335
Ohio County—		
Tuttle et al, Berry 2	5	610

* Failures; † Junked; ¶ Million cu. ft. gas.

Ohio Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
Athens County—		
Bowman O&G Co., Rogaski 7	¶.09	1675
Cuyahoga County—		
Harry Dempsey, Kelly 1	*	3308
Guernsey County—		
Ronshausen et al, O. Legge 1	¶	1121
Hocking County—		
Ohio Fuel Gas Co., Sunday Creek 6641	¶.20	438
Lawrence County—		
Star Gas Co., Keeney 1	¶.20	2665
Licking County—		
J. T. Bebout, Holtz 2	¶.75	2594
McClay Bros., Orr 2	¶.50	2317
Hoover Bros., Pound 2	¶.40	2638
Ohio Fuel Gas Co., Hoover 1	¶.29	2622
Lorain County—		
Ohio Fuel Gas Co., Kopiso 2	¶.31	2337
Medina County—		
Preston Oil Co., Parent 33	50	409
Dillon & McFrederick, Coomer 1	¶.90	2674
Meigs County —		
A. Roberts, M. Carleton 1	¶	1082
Monroe County—		
Gold Crown O&G Co., Strickling 2	2	1325
Walker et al, Moore 1	¶2.00	1650
Morgan County—		
Williams et al, Hammond 2	*	784
Noble County—		
Rich et al, Rich 1	¶	1506
Yoker Valley O&G Co., Day 2	¶1.60	1499
Perry County—		
Gas Producing Co., Skinner 2	*	3148
Stark County—		
East Ohio Gas Co., Becker 2	¶2.16	4659
Tuscarawas County—		
Brendel Prod. Co., Columbia 3	¶4.00	4768
Washington County—		
H. W. Baker, Duncan 2	¶.43	1048
R. W. Porter, Waggoner 1	¶.08	1236
Bachelor, Sheets 15	*	550
Heldman Gas Co., Eagler 1	*	1332

Pennsylvania Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
Bradford District		
Penn Valley Crude Oil Corp., Redfield	5	....
Alice Freeman et al, Wixon	1	....
McCaffery & Krampf, McCaffery	½	....
Grant & Mohan Oil Co., No. 3, Bing 380-1	2	....
Smith Newton Oil Co., Lincoln	1	....
Audrus & McDowell, 326 Bing	2	....
W. A. Bolles, Bordin	1	....
Forest Petroleum Corp.	1	....
Niagara Oil Corp.	1	....
Bradford Transit Co., 12 wells	12	....
Bradford: Water Intake Wells		
Grant & Mohan Oil Co., No. 3, Bing 486-7	...	....
Forest Oil Corp.	...	....
Forest Petroleum Corp.	...	....
Niagara Oil Corp., 2 wells	...	....
Butler-Armstrong District		
J. A. Ehmer et al, J. A. Ehmer	5	....
Earl A. Oesterling, Leonard Oesterling, Jr.	½	....
Middle District		
M. E. Bolles, E. M. Bolles	¼	....
Malcolm Horwitz, H. G. McFadden	1	....
L. E. Benninghoff, Benninghoff	½	....
New York-Pennsylvania: Gas Field		
New Penn-Cunningham, E. Walroth	¶	....

New York Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
Allegany County—		
Charles P. Johnson et al, Chas. Rogers farm, Scio	3	447
Scio Oil & Gas Co., Betsey Clark farm, Scio	8	865
Simmerson farm, Scio	6	848
H. W. Patterson, Betsey Clark farm, Scio	4	860
Betsey Clark farm, Scio	5	868
Betsey Clark farm, Scio	5	874
Betsey Clark farm, Scio	6	863
Allegany: Water Intake Wells		
Ford Oil Co., Frederick farm, Alma	...	1270
Frederick farm, Alma	...	1264
Harold Duke et al, D. W. Witter farm, Scio	...	1242
Quintet Oil Co., Bledsoe farm, Independence	...	1263
Bledsoe farm, Independence	...	1250
Quaker Oil Co., Brown farm, Alma	...	1139
Yeager & Fanton et al, Fanton farm, Willing	...	1242
Chenunda Creek Oil Co., Richmond farm, Willing	...	1061
H. W. Patterson et al, Coyle farm, Scio	...	912
Coyle farm, Scio	...	922
Coyle farm, Scio	...	915

* Failures; † Junked; ¶ Million cu. ft. gas.

Illinois Fields

Hamilton County wildcat to test lime saturation

Mattoon, Ill.—Kingwood Oil Company's Schnuck 1, SE NE SE Section 2-4n-6e, Hamilton County wildcat, set casing to 3450 feet to test McClosky lime saturation. The well, which had been drilled to 3544 feet, may give the county its first production. It was waiting on cement.

Neither of the two White County wildcats which a week ago indicated new pools in this booming southeastern Illinois area had been completed, but both had been given tests that showed they will make good wells. J. W. "Red" Carter's W. A. Johnson 1, NE SW NE Section 12-4s-10e, 2 miles north of Crossville and 6 miles southwest of Griffin pool, flowed 200 barrels by heads in 16 hours. Production is from the Rosiclare lime. Fifteen miles from production, Penn-Illinois Oil Company's Pyle 1, SE SE NE Section 12-6s-8e, was estimated to be in the 500-barrel class.

A half-mile southerly extension to the Niagaran lime pool at Sandoval, Marion County, was indicated when Menhall and Gulf Refining Company's Goodwin 1, NE NW SE Section 8-2n-1e, reported 1000 feet of oil in the hole after drilling 2 feet in the pay, topped at 2984 feet. The formation was topped 64 feet lower than at the discovery, Southwestern Oil & Gas Company's Benoist 21. East 100 feet from Goodwin 1, Kingwood Oil Company's Konrad 1, 30 feet from the north line and 50 feet from the west line, NE SE Section 8-2n-1e, set casing to 3094 feet, through the Niagaran pay which was encountered at about the same level as at the Goodwin 1. The casing was to be gun-perforated.

Illinois Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
Adams County—		
Robinson et al, Fowler 1	*	1003
Clark County—		
Leatherman, Tyrhurst 2	*	50
Scharp & Stipes, Sharp 1	*	46
Jinks, W. A. Johnson 1	*	535
Clay County—		
Pure, Clay City Bank 11A	1000	3140
Verda Gill 1	54	3080
W. S. Hosselton 1	90	3095
Wiser Oil Co., Daly 5	808	3121
John Daly 6	486	3135
Clinton County—		
Williams et al, Dunn 1	228	1342
Crawford County—		
Downey & Connor, Cockran 1	6	962
Douglas County—		
Lewellon & Phillips, Kennedy 2	*	401
Edwards County—		
Dye et al, Lemke 1	*	3185
Fayette County—		
Gulf, Small 2	178	1583
Small 4	159	1574
Texas Co., Griffith 3	168	1595
Lee Dr. Co., Stine 1	*	1982
Carter, Goodson 8	196	1589
Helen Walker 3	312	1579
Leona Williams 5	244	1588
Coddington 7	491	1548
M. B. Heckert 6	372	1551
Gallatin County—		
Vandenbark, Busick 1	*	2454
Jefferson County—		
Petrie, McCracken et al, Roper 1	*	2352
Transcontinental, Carrol 1	*	2279
Magnolia, Davis 1	*	3066
McDonough County—		
L. G. Kellar, Wright 1	*	677
Madison County—		
Erie Dr. Co., Kaseburg 1	*	1420
Marion County—		
Texas Co., Johnson-Richardson 1	371	1952
Johnson-Hawkins 1	55	1775
L. Hawthorne 21	175	1832
E. Snyder 3	196	1941
Brooks 2	630	2010
W. Fossiech 9	210	2023
W. Fossiech 10	420	2051
W. Fossiech 11	791	2060
Frontier Oil Co., Frederick 3	180	1840
Blackstock, M. & I. RR. 2C	525	2050
Hart et al, Young School 3	480	1866
Magnolia, W. B. Young 24	192	2075
W. O. Chitwood 31	468	2060
W. O. Chitwood 32	384	2078
Ohio, M. J. Young 7	1011	2052
M. Young Hrs. 14	706	1885
M. Young Hrs. 16	185	2080
N. J. Young 10	211	2080
Shell, Salem State Bank 5A	420	2060
Salem State Bank 4B	120	1952
Salem State Bank 5B	600	1870
Haynes & Thomas, F. Lee Roadway 2	480	2043
Montgomery County—		
Jack S. Brown, C. W. Hefley 1	*	2106
Perry County—		
Kingwood Oil Co., Broleman 1	*	1703
Pres. Cockran, Geacoma 1	*	1619
E. J. Schaefer, F. Sprague 1	*	1400
Richland County—		
Leathers et al, Roy Malone 1	*	2585
Pure Oil Co., Lilly J. Coen 1	*	....
St. Clair County—		
Skye & Benson, H. Schulte 2	*	835
Gladiator Oil Co., Hoffstetter 1	*	630
W. B. Greer, Fullmer 1	*	220
Schuyler County—		
O. A. Reed, J. P. Long 1	*	877
Shelby County—		
Fletcher et al, Hellick & Willard 1	*	1993
Wabash County—		
Harry Fotiades, French 1	702	2445
Tide Water Associated, Buchholz 1	*	2880
Continental, Charles Scharf 1	150	2484
Washington County—		
Magnolia, J. Nowak 3	27	1275
O. W. Francis 11	30	1302
Shell, F. Sharkowski 1	27	1255
M. Kozuszek 1	163	1279
Wayne County—		
Illinois-Mid-Continent, Puckett 1	300	3386
Emma Wilson 3	350	3404
New Penn Dev. Co., Pruiett 1	7	3412
Whiteway Oil Co., Pollard 1	125	3428
Iroquois O&G Co., Masterson 1	170	3490

* Failures; † Junked; ¶ Million cu. ft. gas.

Hobart pool spacing program

Tulsa.—Shell Oil Company and others have been granted 10-acre well spacing for Hobart pool of Kiowa County, by the Corporation Commission of Oklahoma. The discovery well was completed in 20-7n-17w. There are two producers.

North Texas Fields

Hull-Silk rivals K-M-A in volume of development work. Lower allowables possibly halt outlets, slow development.

Wichita Falls, Texas.—Strawn development in the Consolidated pool, southeastern Wilbarger County, accounted for a failure when Consolidated Oil Company et al's W. T. Waggoner 1-DD, NW SW SE H&TC Section 1, Block 5, tested salt water at 4235 feet. Saturated zone at 4195-4213 feet gave promise of making a producer, although the test was low on structure, having topped the lime at 3896 feet, or 92 feet lower than the partnership's recently completed discovery pumper, situated 1⅓ miles to the southeast. Waggoner 1-DD has been plugged back to 1843 feet to perforate casing opposite oil sand logged at 1836-43 feet.

Lido Oil Company's W. T. Waggoner 21-C, SE NE H&TC Section 52, Block 2, west edge of shallower production in Wilbarger County's South Vernon district, flowed 95 barrels of high-gravity oil in 3 hours through tubing chokes for completion after using 200 gallons of acid in lime at 3635-60 feet. This well establishes a new deep pay for the area.

The Hull-Silk field, Archer County deep lime area, is becoming a rival to the K-M-A field for leadership in drilling activity. Development of the older area is gaining each week, while the northeast extension continues to furnish the largest producers in the 4300-foot zone. A pipe line connection and market outlet is now available for all wells as result of completion late last week of Sinclair Refining Company's 4-inch extension line into the northeast extension sector. Continental Oil Company's Wilson-McCrory 1, offset to production, is a late completion. This well flowed 150 barrels of 41° oil natural in 3 hours through ¾-inch choke from broken pay at 4300-60 feet.

W. B. Hamilton et al's C. E. Graham 4, S. Abercrombie Survey, A-1249, 1 mile west by south of Anarene, has opened a new shallow pool for Archer County, with a flow of 150 barrels of oil in 8 hours after using acid in lime at 1228-37 feet. Two deep wildcats are getting underway in the east and south part of Archer County. Perkins-Cullum et al's Falls County 183, Block

North Texas Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
Archer County (Hull-Silk)—		
Phillips, Moss 1	3064	4327
Archer County (K-M-A)—		
White-Duncan & Dye, Ferguson 5, blk 14	440	3885
Archer County—		
Craig et al, Andrews 1, sec 1824	*	963
Ligon et al, Carson 3, sec 1	*	1312
Clay County—		
Morgan & Bearnard, Brannon 1, lot 59	*	387
Parks et al, Huff 1	*	1162
Clay County (Wildcat)—		
Youngblood-Foree & Ramsey Pet. Corp., Wynn 1	*	6070
Cooke County—		
Staley et al, Voth 2	120	1808
Whitfield-Pearson & Grimes, Voth 1-B	250	1758
Voth 2-B	480	1750
Cooke County (Wildcat)—		
Anderson et al, Coursey 1	*	2065
Cottle County (Wildcat)—		
Magnolia, Green 1	*	6142
Grayson County (Wildcat)—		
Gray et al, Freeman 1	*	1407
Jack County (Wildcat)—		
Evans et al, Knox C. S. Lands 1	*	470
Wichita County (K-M-A)—		
E. C. Oil Co., Burnside 2-A	1144	3920
Mangold 12, sec 37	880	3810
Hammond et al, Strauss 1-A, blk 22	1632	3867
Magnolia, Kempner 2, blk 19	768	3825
McCutchin et al, Denny 4	117	4008
Trio Oil Co., Birk 4	1104	4039
Wichita County—		
Forbess & Golden, Mertens 9-A	*	1261
Magnolia, Reilly 155	56	1419
Perkins-Cullum et al, Burnett 22-A, sec 1	*	1580
Staniforth et al, S. George-Reilly (Texaco) 5	12	1442
Price-McDonald & Atwood, F. P. Warren 1	*	1800
Underwood Oil Co., Geo. Hieserman 1, sec 3	*	1815
Young County—		
Christie Bros., Street 4, sec 1	1950	3435
Cosden Pet. Corp., Shanafelt 1, sec 11	232	2804
Crenshaw et al, Ragland 2-A	100	3825
Watson et al, Routon 2, sec 243	*	750
Zweifel et al, Sewall 3-C	680	4031
Young County (Wildcat)—		
Massingill et al, Carter 1	*	3104

* Failures; † Junked; ¶ Million cu. ft. gas.

21, Falls County School Land Survey, A-130, situated within a shallow pool, is preparing to deepen from 2500 feet to 5000 feet. L. T. Burns et al's Jake Penartz 1, SEc Lot 19, Block 4, Clark-Plumb Survey, 2½ miles west by north of Windthorst, is rigging up for a 4000-foot test.

More development is in store for the Halsell 2-well lower Strawn pool, western Clay County, as result of Bridwell Oil Company having procured a permanent market for its high-gravity producers. The company strung 5 miles of 2-inch line to Gulf Refining Company's Henrietta station booster station.

Reduced allowables imposed on new pools in the district early last week by the Texas Railroad Commission may have direct bearing on the volume of development to be given these areas. The cut will cause a delay in obtaining pipe line connections for some of the pools, although the best prospects attracted pipe lines just prior to the slash. The Nocona deep area, Montague County, was given its first direct outlet last mid-week when Sinclair Refining Company placed in operation a 3-mile 4-inch system, extending from its Oklahoma-Houston carrier.

Phillips Petroleum Company's Custers 1, northeast edge failure in the Strawn for the Bonita pool, eastern Montague County, plugged back from granite at 3768 feet to the original oil level at 2895 feet, with a small well in prospect. The well flowed small heads after 20-quart nitro shot at 2882-90 feet. In southwestern Montague County, Sackett and Continental Oil Company's Brown 1, 5½ miles northeast of Bowie, is awaiting orders at 5049 feet in shale after fulfilling depth contract.

First Nolan County oil well flowing by heads

Abilene, Texas.—The first oil production for Nolan County was attained September 24 when Green-Owens et al (was Chas. E. Peddicord et al's) C. W. Tipton 1, near SE NW SW T&P Section 43, Block 19, began flowing by heads from top of sand in lower Pennsylvanian at 5137-38 feet. The daily production rate was not immediately established, as the heads of high-gravity oil were of short duration and through a column of salt water carried from above while drilling with tools. A string of 5-3/16-inch casing cemented at 4236 feet failed to shut off water, and a string of 4-inch will be landed before attempting a completion.

Tipton 1 is located in northeast corner of Nolan County, 2 miles west by south of Trent, and 4½ miles southwest of the Noodle Creek field, oldest oil area in Jones County. Operations began in September, 1938, with first show of oil at 4402-64 feet. Casing parted while preparing for a production test, making it necessary to plug back and whipstock out of old hole at 2640 feet. Top of Noodle Creek lime was called at 2775 feet, with an elevation of 1975 feet, and Adams Branch was logged at 4083-4150 feet.

Plymouth Oil Company's McClure 1, projected Ordovician, or 8000-foot test for Nolan County, was fishing for drill pipe at 4209 feet. Location is 2½ miles east by south of Roscoe.

West Texas Fields

Second Permian well at North Cowden showing prospects. Importance of Seminole production further emphasized.

Midland, Texas.—Completion of a second deep Permian-lime oil producer on the west edge of the North Cowden field, Ector County, was in prospect late last week. Stanolind Oil & Gas Company's B. H. Blakeney 1-A, C NE SW T&P Section 28, Block 43, T-1-N, cored the lower pay section at 5120-60 feet, with an elevation of 3085 feet, then installed tools to try for a completion.

Bailing was in progress 200 feet off bottom last Friday. Tubing will be run before testing.

Cores indicate adequate porosity and saturation to make a well after acidizing. It is 3 miles southeast of Gulf Oil Corporation's Holt 1, which uncovered the new oil zone in the lower mid-Permian at 5148-68 feet last June after plugging back from water at 5187-5200 feet, with an elevation of 3091 feet. Holt 1 flowed 217 barrels of 38.6° gravity oil initial. The new prospect originally was slated to complete in the regular 4200-foot zone, which proved dry after landing 7-inch at 3895 feet. Sinclair Prairie Oil Company's Holt 3, east offset to the Holt deep producer, is to drill to the new zone. Other operators are considering tests to the new level, and explorations may spread to other nearby fields.

The Wasson-Bennett district, Yoakum County, was given a nominal northwest extension, and also added an outpost failure. F. M. Allison Producing Company et al's Bush 1, SW NW SW Section 629, 1½ miles east by north of production in the Bennett area, was ordered abandoned in water at 5462 feet. Top of solid lime was logged at 4860 feet, or 1284 feet, subsea, thereby registering a sharp structural dip that will be a contributing factor in defining the east line of production. Aloco Oil Company's W. S. Knight-Texaco 1, NW SE SE Section 773, ¼-mile west of production, paved the way for additional extensions in registering a potential of 773 barrels after 600-quart nitro shot in lime at 4937-5244 feet. The company's Morris-Texaco 1, C SW SW Section 732, ½-mile north of production, was drilling at 4530 feet. Tide Water Associated Oil Company paid $40,000, half cash, for lease on SE Section 897, offsetting production on the southwest.

Lease trading and the sale of protection acreage against wildcat projects have been stimulated in recent weeks. Tom Sloan et al have completed the financing of a long deferred test proposed for northeast corner of Yoakum County, with a portion of the block extending into Terry County. Operations are due to begin by November 1, for a Permian test near C SW SE Section 22, Block D.

Drilling obligation was assumed by The Atlantic Refining Company in acquiring lease on 1200 acres in League 56, Oldham County School Lands, Cochran County, with test slated to start by mid-October in Labor 11. Humble Oil & Refining Company originally assigned 1400 acres to Cascade Petroleum Company for a test, with 1/16 over-riding royalty. The latter turned the block to The Atlantic Refining Company, retaining Labor No. 1. C. Ed Hyde and Dean Brothers have financed the drilling of a wildcat on their Cochran County block, centering 6½ miles southeast of the Dean pool. Contractor is rigging up to drill Reed 1, C SE SE Section 21, Harrison-Brown Survey.

Forest Development Corporation's I. E. Scott 1, C SE H&GN Section 286, Block 13, southeastern Reeves County, encountered salt water in lower Delaware at 5333-36 feet. Hole will be plugged back for nitro shot in oil-stained sand at 4900-28 feet. Top of Delaware sand was called at 4883 feet, with an elevation of 3005 feet.

Seminole Importance Emphasized

Natural flow of 767 barrels of oil in 17 hours through ¼-inch tubing choke credited to Ohio Oil Company's W. G. Gibbs 1, C SE SW W. T. Section 230, Block G, emphasizes the production possibilities of the Seminole 16-well pool, Gaines County. The area is the most important in West Texas without a pipe line connection. It has a maximum width of 2½ miles on the north end, and extends 5 miles along a northwest-to-southeast trend. Ohio Oil Company's producer logged broken lime pay at 5072-5268 feet, representing a 196-foot section. It is 1 mile north and ¼ mile west of nearest production that is adjacent to the discovery site.

North extension for the Seminole area is to be sought by Osage Drilling Company's G. D. Johnson-Ohio 1, C SE SE Section 268, situated 1 mile north of Amerada Petroleum Corporation's Auten 1, which was drilling at 3770 feet. Osage Drilling Company's Tippett-Ohio 1-A, C NW NE Section 266, west offset to the most northwesterly producer, flowed 10 to 15 barrels of oil hourly after using 2000 gallons of acid at 5289 feet. It was re-treated with 6000 gallons of acid to increase the flow to 546 barrels in 12½ hours. The company's Crain-Shell 1, west offset to the most northeasterly producer, encountered tight lime condition in drilling to 5320 feet, and was swabbing 3 to 5 barrels of oil hourly after nitro shot and acid treatments.

Ordovician development in northern Pecos County promises to attain important proportions in the form of wildcatting and routine drilling in the Apco 2-well pool, which has 5 tests drilling and scheduled. Childress Royalty Company is starting a southeast offset to the deep discovery after obtaining deep rights from Indian Territory Illuminating Oil Company on E¼ Section 104, with the latter retaining 3/32 over-riding royalty. Childress Royalty Company has been developing shallow production on the same 160-acre tract. Anderson-Prichard Oil Corporation and Monte Warner's Masterson 1, Apco pool deep discovery, gauged 424 barrels of oil initial through 1-inch tubing choke after using 1500 gallons of acid in Ellenberger at 4555-

95 feet. It was originally completed April 30, and on completion gauge taken June 1 flowed 184 barrels of 40.4-gravity oil natural through 18/64-inch choke. Response to acid was not as great as the pool's second completion by Magnolia Petroleum Company. The partnership cemented 10-inch at 620 feet for Masterson 2, C N¼ N¼ Section 104, and locations made for the other 2 drilling sites on the 160-acre lease. Magnolia Petroleum Company's J. S. Masterson 1, C N¼ S¼ Section 104, was drilling at 650 feet. Field rules require locations to be made at center of 40-acre units.

Humble Oil & Refining Company has authorized the drilling of an Ordovician prospect 8 miles northwest of the Apco area, and on the B. D. Young land, H&GN Section 33, Block 10. The company has a similar obligation to be started within the next 6 months on the Colden land, centering about 5 miles north by west of the deep pool.

Gulf Oil Corporation's Waddell et al 11, SEc PSL Section 20, Block 21, 3 miles north by west of the most northeasterly producer in the Sand Hills field, Crane County, and southeast of the McKnight pool, is showing for a small producer in lower Permian at 4680 feet, or 2045 feet sub sea. The well swabbed 137 barrels net oil in 17½ hours after using 5000 gallons of acid. This deeper Permian section was also present in Loffland et al's Tubb-Gulf 2. Having failed to encounter water in the lower Permian in drilling to 5246 feet, Gulf Oil Corporation's McKnight 5, C SE PSL Section 1, Block B-21, may continue to the Ordovician. However, crooked hole has necessitated 3 nitro shots below 4885 feet. Due to its relatively low structural position it was slated to abandon upon reaching water.

West Texas Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
Crane County (McCamey)—		
Pittman & Simco, Hughes-Conoco 1	6	2572
Crane County (Gulf-McElroy)—		
Gulf, J. T. McElroy 200	1390	2902
J. T. McElroy 201	1489	2898
Crane County (Waddell)—		
Gulf, W. N. Waddell 27	5708	3512
Crockett County (Crockett)—		
Gilcrease Oil Co., University-Humble 9-14	103	1451
Culberson County (Wildcats)—		
Quito Oil Corp., Cameron Lumber Co. 1	*	945
L. G. Sheddan et al, S. J. Isaacks 1	*	280
Dickens County (Wildcat)—		
Andy Urban et al (was Hanson-Anderson), C. D. Byrd 1	*	3420
Ector County (Foster)—		
I. T. I. O. Co., Johnson 1	517	4225
Stanolind, E. F. Cowden 24-B	797	4190
Sunray Oil Co.-York & Harper, Johnson 6	638	4290
York-Harper, Inc.-Sloan & Zook Co., Foster 9-D	1580	4325
Ector County (Goldsmith)—		
Gulf, Goldsmith 218	1254	4205
Goldsmith 219	1236	4184
Ector County (Jordan)—		
Kewanee Oil Co., University 7-A	1325	3648
Skelly & Atlantic, University 4-E	606	3640
Ector County (North Cowden)—		
Landreth Prod. Corp., Holt-Texaco 3-A	926	4305
Sinclair Prairie, Corrigan 7	3149	4405
Gaines County (Wildcat)—		
Stanolind, Rayner 1	1082	4830
Hockley County (Slaughter)—		
Honolulu Oil Corp., Mallet 1-6-52	435	5038
Pecos County (Taylor-Link)—		
Clark & Hudson, University-Standard 1	393	1633
Pecos County (Tobarg)—		
Marvin-Henderson Oil Co., Trippett-Conoco 7-C	11	416
Pecos County (Wildcat)—		
E. R. Lloyd-Penn & Hargraves, Bonebrake-Ohio 1	*	1727
Sutton County (Wildcat)—		
Suttex O&G Co. (was Holland et al), Allison 1	*	885
Upton County (McCamey)—		
Shell, Bowen 44	379	2175
Ward County—		
Gulf, G. W. O'Brien 114	109	2775
G. W. O'Brien 115	1028	2780
McQueen & Clevenger, Sealy 3	456	3075
Reno Oil Co., Hardage-Wilson 8	72	2535
Stanolind, E. H. Brown 5	185	2375
Winkler County (Henderson)—		
W. K. Roy. Co., Walton-Humble 10-B	270	3068
Winkler County (Keystone)—		
J. T. Barnes et al, M. E. Crum 5-B	455	3415
Gulf, Keystone 33	442	3402
Winkler County (Kermit)—		
Murko Oil & Roy. Co. (was Sturm-Nolan), Brown-Altman 1	¶20.8	2700
Winkler County (Scarborough)—		
Gulf, Daugherty 72	848	3022
Yoakum County (Bennett)—		
Devonian Oil Co., Hodges 7	654	5225
T. P. Coal & Oil Co., Bennett 23	1603	5238
Yoakum County (Wasson)—		
Aloco Oil Co., Hovencamp-Texaco 2	1899	5111
W. S. Knight-Texaco 1	773	5244
Continental-Helmerich & Payne Dowell 2	751	5120
Don Danvers et al, Dowell 2	883	5132
Eastland Oil Co., Chandler-Skelly 2	1032	5208
Shell, Johnson 1	656	5235
Skelly, Rhodes 2	659	5130

* Failures; † Junked; ¶ Million cu. ft. gas.

Texas Panhandle

Panhandle gas area extended to northwest

Amarillo, Texas.—Southeastern Hartley County has a large gasser in process of completion that will provide an extension to the northwest portion of the Texas Panhandle gas belt. Phillips Petroleum Company's W. K. Gordon 1, SW SW NE H&TC Section 2, Block 44, was rated at 34,000,000 cubic feet of dry gas daily while drilling with tools at 3455 feet. First gas was logged at 3260 feet, with an elevation of 3808 feet, and the main gas zone was topped at 3308 feet. The company holds lease on a large block in the area.

In western Wheeler County, Alma Oil Company's J. J. Perkins 1, SE SE SE H&GN Section 56, Block 24, swabbed at rate of 500 barrels daily natural from granite wash at 2405-10 feet, with an elevation of 2486 feet. Tubing has been run for completion.

The Texas Company's J. E. Williams 22, an inside test for the granite wash area in Gray County, earned an initial rating of 928 barrels from pay at 2740-2857 feet to become the largest producer for the district in recent weeks.

Texas Panhandle Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
Carson County—		
Hagy-Harrington & Marsh, Walker 1	¶39.8	2677
Magnolia, Fee (Tract 244) 59	219	3102
Fee (Tract 244) 60	461	3032
Gray County—		
Magnolia, Archer 4	123	3270
J. S. Morse 1-C	255	2655
Texwell Oil Co., Frashier 3	¶2½ & 50	3325
Stanolind, Cobb 4-A	369	3314
Hutchinson County—		
J. E. Crosbie, Pitts 34	496	2950
McIlroy Oil Co. et al, Halle 8	815	3076
Mid-States Oil Corp., Whittenburg 28-A	524	2892
Phillips Pet. Co., Gary Whittenburg 10	132	3311
W. B. Halle 9	386	3105
Texilvania Oil Co., Harvey 8	393	3024
Moore County—		
Burnett et al, Powell 1	¶18¼	3375
Panhandle, Eastern, Brown 1-34	¶53.2	2842
Roberts County (Wildcat)—		
Dunigan et al, P. C. Ledrick 1	*	5428
Wheeler County—		
El Bar Corp., J. M. Noel-Texaco 12	237	2445
Skelly, Mary 2	100	2251

* Failures; † Junked; ¶ Million cu. ft. gas.

East Texas Fields

Flag Lake in Navarro extended to southeast

Tyler, Texas—The Navarro County sector of the Flag Lake field is assured of a short southwest extension as result of Topaz Oil Company's Trammel-Humble 2 having cored oil sand at 2996-3000 feet. The pipe has been ordered cemented on top of the sand. With an elevation of 296 feet, this outpost is 7 feet higher on structure than the company's earlier completion, which proved to be the largest producer in extending the area across the river into Navarro County.

The Texas Company's Critchfield 1, projected 6500-foot wildcat for southern Smith County, encountered the Georgetown lime near the 6000-foot level, and was drilling hard lime at 6040 feet, with an elevation of 508 feet.

In Limestone County, Murray Samuel et al's Barron 1, located 4 miles southwest of Groesbeck, yielded salt water with a trace of gas in upper Glen Rose at 5007-29 feet. Drilling was resumed to proceed to the Lower Trinity series.

Location for 5200-foot test in Shelby County

Shreveport.—W. H. Neel and associates last week made location for J. W. Hanson 1, on a 58-acre tract, A. Samford Survey, Shelby County, Texas, one mile east of Glen Rose gas/distillate production in the Joaquin field of that county. The test will go to the 5200-foot Glen Rose level. The location is near the Sabine River.

Turner & Smith did not set casing for test of an oil showing at 5050 feet in Glen Rose in Panola Development Company 1, G. Gallaspy Survey, Panola County, wildcat but are arranging to drill deeper and then test the present showing if nothing better appears. The operation is 6000 feet north of the same operators' J. W. Bird 1, same survey, that was a 40 million-foot wet gasser at 4998 feet.

Austin.—Increases in allowable for the K-M-A, Hull-Silk and Sikes pools in Archer and Wichita counties will be discussed at a hearing before the Texas Railroad Commission set for October 6, at Austin.

East Texas Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
Joiner Area—		
Humble, Arnold 14 (81-ac)	6000	3760
Kilgore Area—		
Carter et al, Clary 10	80	3545
C. R. Starnes, Money 38-a	1500	3591
Longview Area—		
Magnolia, White 26 (80-ac)	7200	3518
Stanolind-Tide Water, Akin 21 (80-ac)	7500	3626
Tide Water Associated, Davis 22 (133.8-ac)	6400	3740
Camp County (Wildcat)—		
Moss et al, Blackstone 1	*	4600
Ellis County (Wildcat)—		
Ellis County Drl. Co., Trinity University 1	*	563
Falls County (Wildcat)—		
Hayes et al, Wooten 1	*	2137
Houston County (Navarro Crossing)—		
Humble, Dailey-Taylor 4	259	5849
Houston County (Wildcat)—		
Aloco Oil Co., Weisinger 1	*	6034
Leon County (Navarro Crossing)—		
Humble, Hailey 1	¶5.8	5881
Navarro County (Flag Lake)—		
Topaz Oil Co., Trammel-Humble 2	603	3008

* Failures; † Junked; ¶ Million cu. ft. gas.

Southwest Texas Fields

Shallow strikes line up long trend for development. La Gloria outpost furnishes extension and new sand.

Corpus Christi.—Shallow production along the lower Gulf Coast rapidly is regaining its previously important position as September strikes above 3000 feet were increased to 3 during the past week. These new areas line up a trend for development nearly 100 miles long through Goliad, Victoria and Jackson counties.

Houston Oil Company of Texas' Jacob Hornstein 1, W¼ NE Block 43, McKinnon subdivision, 4 miles southwest of Coletto Creek in Victoria County, was being finished as a gas well in the Catahoula sand. Two more locations have been made for immediate drilling in an effort to convert the new area into an oil producer. It found 2 gas sands, one at 2116-25 feet and another at 2858-65 feet. The hole is bottomed at 3041 feet with 5½-inch casing set at 3028 feet. Perforations were being made at last reports.

South Texas Completions

CORPUS CHRISTI DISTRICT

Company, Well and Location	Init. Prod. Bbls.	Depth
Aransas County—		
Atlantic, Kearney 1 (McCampbell)	350	6975
Brooks County—		
Humble, McGill 24 (Kelsey)	250	4739
McGill 26 (Kelsey)	250	4736
Jackson County—		
Humble, Kubecka 2 (Cordelle)	60	2723
Magnolia, West 22-A (West Ranch)	500	5535
Jim Wells County—		
Graham & Mosser, Mosser 5-A (Reynolds)	550	5185
Kilgore, Mosser 2-A (Reynolds)	525	5253
Live Oak County—		
Simmons, McGriff 10-B (Oakville)	¶52	3000
Nueces County—		
Fain, Bock 1-B (Minnie Bock)	425	3827
Magnolia, Johnson 1 (South Clara Driscoll)	blow out	2469
Renwar, Wright 1 (WC), Riverside area, section 5	*	5015
Southern Minerals, Isensee 10 (Saxet)	550	4738
Stanolind, Spessard 27 (Luby)	500	5061
Union, Anderson 2 (Agua Dulce)	¶10 & 100	4884
San Patricio County—		
Bay-Tex, Brown 4 (McCampbell)	325	7185
Commercial, Cryer 1 (Plymouth)	600	5643
Grote & Corgey, Sigmund 1 (McCampbell)	500	7198
Humble, Countiss 5 (East White Point)	600	5633
Plymouth, Hutto & Newman 1 (East White Point)	600	5669
SAN ANTONIO DISTRICT		
Blanco County—		
McCart, Lester 1 (WC), 5 mi ne Johnson City	*	675
Medina County—		
Murrell, Fee 8 (Chicon Lake)	¶1½	375
LAREDO DISTRICT		
Duval County—		
Continental, Driscoll A-38 (Driscoll)	500	3367
Hiawatha, Southland 2-A (Southland)	*	5006
Humble, DCRC 8-E (Eagle Hill)	¶2	1454
Magnolia, DCRC 38 (201) (Piedre Lumbre)	60	1525
Jim Hogg County—		
Harrison, Trevino 3-A (Colorado)	200	3062
Scibienski, Down 1 (WC), El Javali Grant	*	2035
Starr County—		
Packer, Guerra 1 (WC), share 253, porc 69	*	1617
Wood, Wardner 3 (WC), South Ricaby area	*	1806
Webb County—		
Carolina Texas, Barnsley 12 (Carolina Texas)	¶5	5474

* Failures; † Junked; ¶ Million cu. ft. gas.

Just south of Victoria, John Mayo and Trinity Drillers, Incorporated, recently opened a 2500-foot gas and oil field with Vogt 1. A second well is coring for the sand and it should give much information on the crude possibilities of the structure.

Shell Completing One

Several miles southwest of the Houston well and in Goliad County, Shell Oil Company took over D. C. Matthews' Swickheimer 1, CIC Survey, and completion was being effected in a gas sand at 2840-73 feet. The well was drilled as a farmout to 3509 feet, then plugged back to 2914 feet, where casing was set for completion.

To the northeast of these wells, Cordelle field in Jackson County, prolific 2700-2800-foot district, is producing from Catahoula formation. The three new discoveries, plus Coleto Creek and Cordelle, place five areas within the producing columns above 3000 feet.

John G. Mayo and Trinity Drillers, Inc., were attempting to open a new field 12 miles south of Victoria on a Shell Oil Company farmout. T. C. Edwards 1, D. S. Mira Survey, flowed fresh water under 30 pounds working pressure in 40 minutes after perforations were made 5978-85 feet. New perforations were to be made in sand at 5800-18 feet. If these fail to provide a commercial producer, perforations will be made 5310-20 feet, where an excellent oil show was encountered.

In San Patricio Count, Seaboard Oil Corporation of Delaware was testing M. C. Smith 1, 2 miles west Odem. The well had been carried to 7295 feet, plugged back and set casing at 7108 feet. It was testing through perforations just above that level. About 1 mile northeast of East White Point field production in this county, efforts were being made to complete a 4000-foot gas well in a test previously abandoned by the Atlantic Refining Company. Republic Natural Gas Company took over L. Phillips 1, Section 60, and redrilled the old hole which had been abandoned at 6007 feet. It is now bottomed at 4102 feet.

Riverside field of Nueces County received another set back when Renwar Oil Corporation abandoned M. P. Wright 1, west offset to the oil discovery. It was carried to 5029 feet, finding shale 4015-25 feet and sand with oil odor 5025-29 feet.

Magnolia Petroleum Company finally completed Dale O. Maun 1, a mile west of the discovery in La Gloria field of Jim Wells County. The well, after perforating 7219-32 feet, headed 54 barrels of 27.5-gravity crude per day through open tubing. It opens a new deep sand for the field and contributes the first crude oil producing sand. Two wells are drilling north of the distillate pro-

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ducer and a new location has been staked 1 mile southwest of the first well. It is first well contemplated by the company across the line into Brooks County.

Efforts to extend Wade City field of Jim Wells County southeast may meet with success. Rodney Delange and Earl Rowe's McNeill 1, a mile southeast of the 1-well distillate area, cored oil sand at 4766½-79 feet and went to 4880 feet, where test was made.

First attempt to complete Royal Oil Corporation and Pat R. Rutherford's D. Garcia 1, a mile south of Ben Bolt field of Jim Wells County, failed, and the test has been squeezed for other perforations. It is bottomed at 6005 feet, but details of the tests are lacking.

Three rigs busy on Davis 20-well program at Rincon

Mission.—Three rigs are running in the Rincon field of Starr County where W. R. Davis & Company will drill a minimum of 20 condensate wells to a depth of 4200 feet. The company will erect a large recycling plant in the field on some 6000 acres recently acquired from D. D. Davenport and Transwestern Oil Company. Contract for the first 10 wells was awarded to Complete Well Service, Incorporated of Corpus Christi, which has rigs running in Sections 232, 229 and 528.

Transwestern Oil Company several days ago bought the 560 acres of leases held by D. D. Davenport at the north end of the field and in the area considered to be capable of producing crude.

Sun Oil Company has one operation in the field, which to date has had two producers completed. One is a condensate well and the other is producing crude.

Sal Vieja Oil Corporation and Pure Oil Company's Gatewood Newberry 2, San Martin Grant, 7 miles southwest of Port Isabel in Cameron County, blew out but was controlled at approximately 6673 feet. It was drilling ahead below 6850 feet late in the week.

Seven Sparta-Wilcox tests look for deeper horizons

San Antonio.—Two new Sparta-Wilcox tests were being commenced in that trend of South Texas to bring the total on the so-called Mirando-Pettus trend to 7. These wells are on highly important geophysical and geological prospects and their findings will do much to tell the story on the future of these deeper zones in this area. They are sufficiently well separated that sand conditions can be studied to a fair degree after they have reached contract depths.

On the West Tuleta faulted structure in Bee County, Anderson-Prichard Oil Corporation and Mills Bennett Production Company have started moving in materials for an 8400-foot operation on the Robinson tract. The well will be in SE SW SE Section 6, about 3000 feet west and north of the Pettus sand discovery.

Wellington Oil Company of Delaware and Jack W. Frazier were rigging up for J. W. Booth 1, near the center of a 480-acre tract in Indianola Railroad Company Survey 10, on the Fordtran structure in northeastern Victoria County. The Wilcox is expected around 8200 feet in this well. The Texas Company developed shallow gas production and worked a large geophysical picture which is expected to have an excellent chance in deeper zones.

Having found gas in the Queen City sand topped at 5625 feet, Tide Water Associated Oil Company et al's A. M. Bruni 7, Cole-Bruni area in Webb County, was going ahead below 6385 feet, headed to 9000 feet. It is another important operation on the Wilcox trend.

Marshall Purvis et al's Afflerbach et al 1, 4 miles southeast of Yorktown in DeWitt County, was below 7000 feet, 600 feet from contract. Midway Oil & Royalty Company got the Crockett at 3917 feet in Schumacher 1, a 7500-foot Wilcox test 9 miles northeast of Hallettsville, in Lavaca County, and was reportedly about normal at 4768 feet. In Colorado County, on the South Texas and Gulf Coast border, Davis & Company's McLane 1 at Garwood was below coring 8020 feet, and Strake Petroleum, Incorporated, Burford test, near Columbus, was below 8200 feet.

Robstown hearing

The Railroad Commission has scheduled a hearing for October 6, at Austin, to consider operating rules for the Robstown pool in Nueces County.

Operating rules for the Satsuma area in Harris County will be discussed at a hearing set for October 5.

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Texas Gulf Coast

Anchor becomes district's second 10,000-foot field.

Phillips testing new sand in League City outpost.

Houston. — The second 10,000-foot producing oil field in the Texas Gulf Coast was discovered last week when Glenn H. McCarthy's Carr 1 on the Anchor prospect, J. D. J. Valderos Survey, Brazoria County, came in flowing an estimated 75 barrels of 55 gravity distillate and 2,000,000 cubic feet of gas daily from Frio sands at 10,466 feet. This is the second oil field found by McCarthy in Brazoria County in the past few weeks, the first being at Chocolate Bayou with Albert Plummer a co-discoverer.

The first 10,000-foot producing field in the Texas Gulf Coast was at Old Ocean, Brazoria County, on the same trend as the Anchor discovery. Wilson Creek, Matagorda County, produced a little oil from below 10,000 feet but was never commercial.

Carr 1, on a farmout of Humble Oil & Refining Company, was drilled to 10,538 feet where casing was set. It was perforated with 24 shots from 10,460 to 10,466 feet and washed in flowing water white distillate through ⅛-inch choke. Chokes were changed to 11/64-inch on top and 23/64 and 31/64-inch on bottom. Tubing pressure was 3350 pounds; casing was sealed.

Anchor, a geophysical prospect of Humble Oil & Refining Company and Sun Oil Company, was shot by reflection seismograph. Humble drilled two dry wildcats, Masterson 1 and Anderson 1, to 10,033 feet. Neither had any important shows of oil. Anderson 1 was the lower structurally. Principal leaseholders in the area are McCarthy, Humble, Sun, Tide Water Associated Oil Company, Magnolia Petroleum Company, The Texas Company and R. M. Welsh.

Some are comparing the new discovery well at Anchor to wells at Old Ocean field which has horizons from 8634 to 10,670 feet yielding 56 gravity distillate. Old Ocean field has an estimated ultimate recovery of 500,000,000 barrels of oil and is one of the largest fields in the Texas Gulf Coast. Carr 1 logged intermittently from 9250 bottom the same type of sands.

The discovery well at Chocolate Bayou which came in flowing 51 gravity oil, Frio sands, 9875 feet, was dead.

Northeast of production at League City field, Galveston County, Phillips Petroleum Company has plugged back Dugan 1 and is washing the well to test a new horizon for the field after another new deep sand failed to yield commercial oil. The hole had been perforated with 10 shots from 9926 to 9929 feet, where a drill stem test failed. Prior to the above test one made at 9940 to 9943 feet, recovered oil and salt water. On the northwest side of the field the company's Wimhurst 1 is bottomed at 10,679 feet and an electrical log has been run. This is one of the deepest wells drilled at League City.

The second well to be completed in the Lotz sand at Turtle Bay, Chambers County, is Edwards Drilling Company's Sloan 1, drilled to 6585 feet. Casing set at 6575 feet was perforated with 24 shots from 6553 to 6555 feet and the well made 13 barrels of distillate in 19 hours through a 9/64-inch choke with a tubing pressure of 1900 pounds and a casing pressure of 2000 pounds.

H. C. Cockburn and Jack Frazier's Dzierzanowski 1 (Danzig 1), discovery well at Rosenburg, Fort Bend County, was making 4 barrels per hour, 2 to 5 percent salt water, last week through a 7/32-inch choke. Tubing and casing pressure was 1500 pounds. Shut-in pressure was 2700 pounds. This well was completed in Yegua sands at 7746 feet.

South of production at Clear Lake, Harris County, Stanolind Oil & Gas Company was testing Coulter 1, W. Dobie Survey, at the end of the week. The well was drilled to 5850 feet, topping a gas sand at 5530 feet and oil sands at 5843 feet. Five and half-inch casing was set at 5849 feet. The well came in flowing 24 barrels of distillate daily through ⅛-inch choke, with a tubing pressure of 1850 pounds and a casing pressure of 1900 pounds.

To Test Allen Dome

On the southeast flank of Allen dome, which has been dormant for some time, Titanic Oil Company has made location for S. E. Allen 1, 849 feet east and 2317 feet south of the northwest corner of the J. G. and G. W. McNeel League, Brazoria County. George Echols is the drilling contractor and the well is projected to 6000 feet or deeper.

In the Needville area, Fort Bend County, Woodland Oil Company's Berg 1, H.&T.C. No. 25 was abandoned last week at 7834 feet after it had cored several gas sands. The drill pipe became stuck and the company had considerable trouble with the hole. Sands were cored at 6330 to 6335 feet, 6654 to 6676 feet and 7091 to 7099 feet.

Outposts Abandoned

About 3000 feet north of production at Friendswood field, Harris County, Humble Oil & Refining Company has abandoned Humble-West Production Company Fee B-40 at 6761 feet after coring salt water sands in Frio formation at 6263 to 6285 feet.

Southwest of production at Mykawa field, Harris County, McDannald Oil Company has abandoned Schmeltz 1, R. Boatright Survey, after drilling to 6515 feet in shale. Salt water sands were cored up the hole.

Texas Gulf Coast Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
Cedar Point—		
Standard of Texas, State 55-118...	480	5920
Clear Lake—		
Humble, Humble-West Fee C-15...	¶1	5857
Damon Mound—		
Sinclair-Prairie, Bryan A-32.....	24	2877
Dickinson—		
Pure, Wooten Estate 1.....	107	8601
Friendswood—		
Humble, Grey 20	540	6048
West Prod. Co. 7.....	624	6042
Humble-West Fee B-40.....	*	6761
Hull—		
Farris Oil Co., Abel 1.....	*	5318
South Oil Co., Taylor 1.....	*	3521
Louise—		
Pure, Lancaster 6.....	*	5153
Lovall Lake—		
Humble, Turner 2	*	7875
Mykawa—		
McDannald Oil Co., Schmeltz 1...	*	6515
Old Ocean—		
Harrison & Abercromble, Grimes 1	270	10,471
Spindletop—		
Abbott Prod. Co., Sun Oil Co. 1....	14	800
Thompson—		
J. H. Blaffer, Davis 1.....	428	5405
Tomball—		
Humble, Gossett 8.....|	¶1¼	5564
Van Vleck—		
Skelly, Rugeley 5.....	208	8499
Fort Bend County—		
Lloyd Farr et al, Beard 1, Long Point area	*	2110
Woodland Oil Co., Bery 1, Needville area, H.&T.C. No. 25.....	*	7854

* Failures; † Junked; ¶ Million cu. ft. gas.

Recent strikes in Brazoria County, showing relation to Old Ocean

South Louisiana

LaPlace wildcat test shows favorable oil indications. Bancroft test making try for Wilcox oil at 10,305 feet.

Lake Charles.—Pan American Production Company may open a new oil field, the first for St. John the Baptist Parish, if Mills 1, LaPlace prospect, continues to perform as it did last week. It logged sands with a good cut of oil and gas from 8112 to 8140 feet. Water sand was cored at 8130 feet. Electrical log was run and drilling was under way below 8373 feet in shale at the end of the week. Projected depth is 10,500 feet. Report is that this hole is running about 50 feet higher than Shell Oil Company's Godchaux Sugars 1, Section 97-11s-7e, which was abandoned in November, 1938, at 11,005 feet.

LaPlace is a geophysical prospect found by Shell Oil Company. Pan American Production Company is operating on a farm-out agreement with Shell Oil Company under which the former received a half-interest in 7600 acres for a deep test. Godchaux Sugars 1 cored sands showing oil at 8750 feet, 8923 feet and salt water sands at 8933 to 8934 feet. After drilling to 11,005 feet in Oligocene the hole was plugged back and several horizons tested showed salt water.

Republic Production Company's Lutcher-Moore 9, at Bancroft field, Beauregard Parish, last week set 5½-inch casing at 10,118 feet to make a production test. Wilcox was topped below 10,280 feet and oil sands were logged around 10,305 feet. It is understood that a good section of sand was cored. Bancroft has been producing from Sparta around 7340 feet.

Amerada Petroleum Corporation has logged oil sands in its first well at Grand Bay, discovered by Superior Oil Company, Cameron Parish. State Mallard Bay 1 was drilling in shale afer coring the regular producing sand at 8385 to 8415 feet; it also had an oil sand at 6790 to 6810 feet.

Shell Oil Company has completed its second well at Chalkley, Cameron Parish. Hanszen 3 was perforated with 95 shots from 8883 to 8915 feet and came in flowing 440 barrels of pipe line oil daily through a 11/64-inch choke. Tubing pressure was 1500 pounds and casing pressure 1900 pounds.

The California Company took three 5500-acre blocks from Long-Bell Lumber Company in Beauregard Parish some time ago and has drilled one 10,000-foot dry hole. The company has made location for Long Bell Lumber Company 2 on the Hickory Branch prospect, 960 feet from the west line and 1795 feet from the north line of Section 12-9s-10w. The first well on the Bannister prospect drilled into Wilcox and made several tests.

On the Section 28 salt dome, St. Martin Parish, William Helis has made location for Rycade Oil Company 1, NEc 33-9s-7e. Helis already is drilling Levert-St. John 1, in this area; it is down to 5462 feet and side wall cores are being taken.

Latamier, Avoyelles Parish, received a setback last week when Carter-Rubsamen et al's Boyette 1 failed to produce from Wilcox. After topping the formation at 5231 feet the wildcat logged an odor of oil at 5232 feet and salt water sands were cored at 5460 to 5550 feet. Hole was abandoned at 5550 feet.

South Louisiana Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
Abbeville—		
Stanolind, Kibbe 1	*	8019
Bancroft—		
Republic, Whitman-Black 1	263	7308
Chalkley—		
Shell, Hanszen 3	440	8915
Charenton—		
Pan American, Laws 16	*	7204
DeArmand, Allemand 4	358	1128
Kerns 4	129	1128
Simoneaux	270	1204
Knisley Pet. Co., Hertel 8	150	1134
East Hackberry—		
Gulf, Erwin A-26	*	3751
Eola—		
Amerada, Marchive 3	665	8480
Marchive 4	779	8525
Golden Meadows—		
Berkshire, Nichols 3	264	5311
Nichols 5	216	2676
Taylor-Fithian, Parra 1	230	5182
Wm. Helis, Gaspard-Riznn 1	413	7930
New Iberia—		
Acadian Prod. Co., Weeks 3	*	1132
Lisbon-Iberia Oil Co., Gulf Fee 2 (wo)	102	5112
Ville Platte—		
Continental, A. Tate 2	363	9043
O. Deville 4	384	9050
L. Haas 5	360	9083
R. Daniel 2	304	9095
Valentine—		
Pan American, Ducos & Abribat 3	*	6750
West Hackberry—		
Union Sulphur, Doiron 12	545	6880
Avoyelles Parish—		
Carter-Rubsamen et al, Boyette 1, Latanier area, 28-3n-5e	*	5550
St. Tammany Parish—		
Honey Island Dev. Co., Forbes 1, Honey Island prospect, 33-7s-15e	*	100

* Failures; † Junked; ¶ Million cu. ft. gas.

Louisiana issues 26 permits for new wells

Twenty-six drilling permits were issued last week by the Louisiana Conservation Commission. Thirteen were in North Louisiana in the following parishes: Caddo 10, Morehouse 1, and Sabine 2. Those in South Louisiana were in the following parishes: Acadia 1, Avoyelles 1, Cameron 2, East Baton Rouge 1, Iberville 3, Jefferson Davis 1, LaFourche 2, and Rapides 2.

Permits reflect increase in West Virginia drilling

West Virginia drilling activity, as reflected in permits issued by N. P. Rhinehart, chief of the state department of mines, gained slightly in August over the previous month and equalled activity of a year ago.

August permits totaled 66, a gain of 7 or 11.9 percent over the 59 issued in July. Permits issued during the first 8 months of this year total 417, representing a decline of 13 or 3.02 percent from the 430 issued during the same period a year ago. Compared to 2 years ago when 718 permits were issued during the first 8 months, drilling activity is running 41.92 percent behind.

August permits by counties follow: Boone, 2; Braxton, 3; Cabell, 3; Calhoun, 9; Clay, 4; Gilmer, 1; Jackson, 2; Kanawha, 9; Lewis, 1; Lincoln, 1; Marion, 1; Monongalia, 1; Pleasants, 3; Putnam, 1; Ritchie, 8; Roane, 5; Tyler, 1; Upshur, 2; Wayne, 3; Wetzel, 5; and Wirt, 1.

C. W. LOMAX, H. W. Lomax and H. E. Witherell last week organized the Lomax Oil Company, Inc., as an Illinois corporation. Headquarters have been established at 306 Pennsylvania Avenue, Abingdon.

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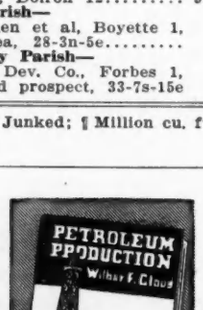

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North Louisiana Fields

Cotton Valley edge well flows 30 barrels oil per hour.

Pine Island test below 8000 feet withholding information.

Shreveport.—One of the best oil wells ever completed from the "D" sand of the Lower Marine at Cotton Valley, Webster Parish, was completed last week in Hunt Oil Company's E. L. Stewart 2, C NE SW 32-21n-10w, on the west side of the field. The well was completed from the "D" horizon logged from 8465 to 8497 feet after perforating casing with 120 shots, flowing 30 barrels of oil per hour through ⅜-inch tubing choke, with casing pressure 1600 pounds, and tubing, 800 pounds. Total depth was 8595 feet in the Bodcaw or "E" sand that topped at 8557 feet with distillate appearing in this horizon. With elevation of 247 feet this well topped the Lower Marine series at 8129 feet. No Holloway (Travis Peak) sand was logged.

Completion of this good well will give added impetus to seeking production in the Lower Marine on the west flank of the field. Tide Water Associated Oil Company plans a west offset at once. There are 20 wells producing oil from the "D" and "E" sands at Cotton Valley and each well for October has a daily allowable of 275 barrels, save one drilled before the 80-acre space rule and it has an allowable of 60 barrels daily.

Gulf Refining Company was reaming down to 4450 feet last week in Hodges 20, SE SW NE 24-16n-12w, proposed Lower Marine test in the shallow Elm Grove gas field, preparatory to deepening after the test showed estimated 4 million cubic feet of gas with a showing of oil and distillate and 500 barrels of salt water on a drill-stem test with ¾-inch chokes top and bottom in the Jeter sand of the Glen Rose at 4423 feet. With elevation of 162 feet the test logged massive anhydrite from 4018 to 4265 feet. The formation tester was run after the well had a gas blowout which was killed. A test drilled a number of years ago 500 feet from present location had a similar showing in the Jeter horizon. It was not a commercial well in this horizon.

Hodges 20 checked considerably higher than Prairie River Syndicate's Hutchinson 2, located 4055 feet north and 480 feet east SWc 3-15n-12w, Caddo Parish, which logged massive anhydrite at 4146-4398 feet; elevation is 163 feet. Prairie River Syndicate has temporarily abandoned its test at 6010 feet until such time as the Hodges 20 reaches Lower Marine, owners announced last week.

Stanolind Oil & Gas Company's Dillon Heirs 131, C SE NE 14-21n-15w, deep test in the shallow Pine Island field, Caddo Parish, drilled at estimated depth of 8175 feet last week, the well being "tight." Last definite known formation was at 8080 feet in shale. Sand bodies logged between 5400 and present depth have been reported insufficient to produce. With elevation of 237 feet the last known marker announced as top of Lower Marine at 5995 feet. The test probably will continue to the Smackover lime.

Union Producing Company was reported planning to run tester to 7276 feet in its deep Morehouse Parish wildcat, Tensas Delta A-1, NE SW SE 8-22n-4e; elevation is 71 feet. Arkansas Fuel Oil Company's Louisiana Central Lumber Company 1, C NW SW 31-12n-3e, Caldwell Parish, drilled at 7320 feet.

Lisbon Exploration Company's Roberta Vaughn 1, SW NW NE 36-21n-5w, proposed 8500-foot Lower Marine test in Lisbon, Claiborne Parish, drilled hard sand at 7712 feet, expecting top of Lower Marine at any time; elevation is 362 feet. Top of Travis Peak was 5405 feet.

Arkansas Fuel Oil Company made location last week and was rigging for its fourth in a series of five tests seeking oil production on the north and northeast flanks of the shallow Waskom field. The previous wells, all on the Texas side of the structure, have all been gas/distillate wells in the basal Glen Rose or Travis Peak horizons. The present test is 1½ miles northeast of Waskom and is W. M. Bell 1, located 1067 feet east and 1213 feet north of SWc 6-17n-16w, Caddo Parish.

Petersen Petroleum Company has set 10-inch casing at 100 feet in a wildcat test in LaSalle Parish, with contract depth 50 feet in the Wilcox. It is on a 2500-acre block and is LaSalle 1, SE NW SE 36-9n-2e, LaSalle Parish, six miles outside Urania production.

Shell Oil Company will acquire the large block of acreage assembled in Township 4 north, Range 12 west, Sabine Parish, by Roy Anderson and will drill a deep test. The acreage was assembled after extensive geophysical exploration and core-hole drilling.

Oklahoma-Texas Trust Company's Frost Lumber Company 3, Section 22-9n-13w, outside test near Converse, Sabine Parish, was arranging to test again at 3041 feet after first test showed estimated quarter-million cubic feet of gas daily with a showing of oil, 10 feet above present total depth.

North Louisiana Completions

Company, Wel and Location	Init. Prod. Bbls.	Depth
Franklin Parish (Wildcat)—		
Continental, Sherrouse 1, 22-13n-8e	*	1839
Webster Parish (Cotton Valley)—		
Hunt Oil Co., E. L. Stewart 2, 32-21n-10w	720	8595
Hassie Hunt, Gardner 1, 22-21n-10w	25	5894
Gardner 2, 22-21n-10w	197	5907

* Failures; † Junked; ¶ Million cu. ft. gas.

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SHREVEPORT LOUISIANA

PELCO

Lake Charles—Houma—Converse
New Iberia—Monroe
Cotton Valley—Greggton
Magnolia—Houston

Arkansas Fields

Experiment field given 40-acre spacing by board

El Dorado, Ark.—The Arkansas Oil and Gas Commission at a hearing held September 26 at Magnolia set a 40-acre spacing rule for the new Smackover lime field near Experiment, Columbia County, opened recently by the Atlantic Refining Company's Pinewoods Lumber Company 1, NE NE 16-18-22. The new field was also officially named "Dorcheat." The name is derived from the bayou beside whose banks the discovery well was drilled.

The commission also ordered its engineers to begin a survey at once of tests drilling in the Magnolia field, Columbia County, to determine if there are any tests drilling there which are not in exact center of 40-acre tracts. It halted drilling of two tests that were not in exact center of 40-acre tracts but upon request of the companies involved will permit them to whip stock and drill directional holes so the well will be completed in the center of the 40-acre units. The last session of the Arkansas legislature enacted a law requiring drilling in exact center of space units. The commission granted petition of The Atlantic Refining Company for a special permit to drill on a 20-acre unit in NW SW 18-17-19 at Magnolia, Luel Spain 3, NW SW 18-17-19.

Three new wells were completed last week in the Magnolia field, to bring total of Smackover lime oil producers there to 67. Standard Oil Company's W. F. Merritt 1, C SW SE 16-17-20, on the northwest edge of the field, with elevation of 383 feet, topped Smackover lime at 7544 feet and topped porosity at 7577 feet with total depth of 7664 feet. It was completed making 24 barrels per hour. On the west side of the field, Marine Oil Company's Joel Jones 1, C NE NW 21-17-20, was completed at 7654 feet, after topping porous Smackover lime at 7555 feet; elevation 354 feet.

The Morgan sand (Travis Peak) horizon at Schuler, Union County, the first productive horizon there, found before the Jones sand (lower Marine) or the Reynolds (Smackover) lime, received two new locations last week and since it is not prorated may see several additional early tests to this horizon.

McAlester Fuel Company's E. D. Harris 1, C SW NW 14-17-19, in the Village field, Columbia County, drilled ahead last week at 6819 feet, after testing 5 stands and 2 joints of oil and water in a drill-stem test at 6267-95 feet in the Lower Marine (Cotton Valley) horizon. Elevation is 294 feet and this test logged a showing of oil in the cuttings at 4590-4600 feet. Village produces from the Smackover lime.

Arkansas Oil & Mining Company's St. Louis Union 1, Section 10-11-31, Crawford County wildcat, drilled below 1450 feet after a slight oil showing in the Viola lime at 1136 feet. Present test is in what is known locally as the Mulberry Fault area on an old uplift and is the seventh wildcat test drilled in that vicinity, all of which have had oil showings in this lime, none being of commercial value.

Arkansas Completions

Company, Wel and Location	Init. Prod. Bbls.	Depth
Columbia County (Magnolia)—		
Marine Oil Co., Jones 1, 21-17-20..	432	7654
Southwood Oil Co., Simmons 1, 22-17-20	384	7624
Standard, Merritt 1, 16-17-20	275	7664

* Failures; † Junked; ¶ Million cu. ft. gas.

Arkansas commission issues 6 well permits

Six drilling permits were issued last week by the Arkansas Oil & Gas Commission. They were as follows:

Columbia County—Tide Water Associated Oil Company and Seaboard Oil Company, W. H. Clarke 1, C SE NE 16-18-19; Standard Oil Company, D. R. Booth 1, C NW SE 24-17-20; Arkansas Fuel Oil Company, Willie King 1, C SE SW 16-17-20.

Franklin County—Ozark Natural Gas Company, A. A. Williams 1, located 660 feet north and west C 34-10n-26w.

Nevada County—Berry Asphalt Company, Calloway-Howell 1, located 175 feet west and 220 feet south NEc NE SW 5-14-20.

Union County—Delta Drilling Company, C. T. Grace 1, C SE SE 31-17-14; Marine Oil Company, Marcus D. Justiss 5, located 300 feet north and 465 feet west SEc Lot 7 NW 18-18-17 (Morgan sand well).

Mississippi

Third test rigging up to drill on Tinsley Dome

Jackson, Miss.—O'Brien Brothers and associates of Shreveport rigged for the third test to start in Tinsley Dome field last week, Jennie Stevens 1, C SE NE 13-10n-3w. The two other tests spudded since the completion of the discovery well are operations of Union Producing Company.

In Hinds County on an 8000-acre wildcat block, G. Jeffreys is moving in rig for a 6000-foot wildcat test, Gaddis-McLaurin 1, NW SW 17-7n-2w. The same operator recently abandoned a 7200-foot wildcat in this general area. This was before the Tinsley Dome was discovered.

In Yazoo County, Conroe-Wilcox Minerals Company is busy leasing in Township 12 north, Ranges 1 east and 1 west. In Madison County, B. Chambliss and J. E. Ward have leased over 4000 acres in Townships 10 and 11 north, Ranges 4 and 5 east, near the village of Camden. Natchez Trace Oil Development Company is leasing in the same area and W. C. Castleberry is leasing in Townships 11 and 12 north, Ranges 3 and 4 east. J. Ray Caskey took several hundred acres in Townships 9 and 10 north, Range 2 east. Homer P. Lee is also leasing in Townships 10, 11 and 12 north, Ranges 4 and 5 east.

E. A. Vaughey of Houston has assembled 8000 acres near the town of Lake, eastern Scott County, in Township 6 north, Range 9 east. The block carries no drilling obligation.

Gas Show Logged

R. M. Crabb and associates reported a gas showing below 1200 feet in W. T. Caldwell 1, NW SE 29-9n-15w, wildcat in Kemper County, just north of the village of Daleville and on a 25,000-acre block.

Carter Oil Company has a seismograph unit working in Yazoo County 5 miles from the Tinsley Dome discovery well. It has had a similar unit in northeast Mississippi for several weeks which is now west of Aberdeen, Monroe County. Robert L. Ray has a gravimeter unit working out of McComb in Pike County and Gravimeter Exploration Company has a similar unit working out of Woodville in Wilkinson County.

Texon Drilling Company is drilling at 2705 feet in hard shale and lime in Stallworth Naval Stores 1, Section 25-5n-4w, Washington County, southwest Alabama wildcat, located 115 feet north and 63 degrees east of Danciger Oil Refining Company's Avant 1, drilled several years ago.

Also in Alabama, in Barbour County, W. B. Hinton and associates' Fee 1, Section 14-9n-26e, drilled sand and shale at 5102 feet.

Eight thousand barrels of crude oil from Union Producing Company's G. C. Woodruff 1 was moved last week by tank car to Standard Oil Company of Louisiana's refinery at Baton Rouge, marking first movement of Mississippi-produced crude. The regular gravity-scale price for Louisiana and Arkansas oil will be paid.

D. H. Byrd, president of Byrd-Frost, Inc. and also of Plains Production Company, Dallas, firms, with H. A. Harmon, vice president of the latter company, have acquired approximately 10,000 acres of leases from W. E. Stewart and others, in Townships 5 and 6 north, Ranges 2 and 3 west, Hinds County, Mississippi, and plan an immediate test. This acreage lies approximately 5 miles south of G. Jeffreys' Gaddis-McLaurin 1, NW SW 17-7n-2w, where rig is moving in for a wildcat test. Byrd and Harmon's block is said to be in the vicinity of what has been identified as a 36-mile shoreline and on what has been identified as a high. Ten miles northeast of this supposed high Gulf Refining Company has a block around what has been identified as an interior salt dome.

Sells Petroleum Company of Longview, Texas, has secured a spread of mineral rights from S. J. Collier in Monroe County, northeast Mississippi, in the northwest Alabama basin.

Forty-acre spacing rule for Mississippi field

A 40-acre spacing rule for the new Tinsley Dome (Satartia) field, Yazoo County, Mississippi, was put into effect last week by the Mississippi Oil & Gas Board. The rule specified that tests be located in the center of 40-acre units, but if impractical because of "topography or otherwise" they must not be more than 150 feet from the center of the 40-acre unit.

The board also promulgated rules for setting of casing, safety precautions, etc., in the new field, which was defined by the board as including all of Township 10 north, Ranges 2 and 3 west, Yazoo County.

Rocky Mountain Fields

Montana wildcatting centers in North Cut Bank area. Cut Bank well spuds and is completed in 11 days.

Casper, Wyo. — Wildcatting operations for Montana have centered in the North Cut Bank area lying between the Cut Bank field and the Pondera producing district in Glacier and Toole counties. The area extends some 12 miles north of Cut Bank to where Yukon Oil Company brought in Lungren 1 earlier this year, opening the Darling oil pool.

Two tests are underway in this sector at the present time while a third, A. B. Cobb and The Texas Company's Vasbo 1, SW NE SW 27-37n-5w, was completed this week as a gasser for 350,000 cubic feet daily at 2676 feet. Gas from this well will be used to drill the companies' new start, Bilsted 1, CNW SE 4-36n-5w, 2 miles from the nearest producing well, and about midway between Darling pool and the main Cut Bank field. Operators plan 3 additional wells to be drilled in this sector this fall to test the producing possibilities over the general area.

Italo Petroleum Corporation is drilling on the Toole County side of the district to the south of Pondera in Cornett 1, CSW NW 30-37n-3w, which is below 2226 feet after cementing 8-inch casing at 1960 feet for a water shut off. The well is checking about 100 feet higher structurally than A. B. Cobb's State 1, which completed as a Moulton sand gasser for an initial production of 40,000,000 cubic feet.

A good flowing well for Cut Bank pool is seen in Huber-Montana Corporation's Crowley 3, CNW NW 24-37n-5w, which flowed 12 barrels hourly through drill stem from the Moulton sand at around 2600 feet. The well set a new drilling record for the state when it spudded and completed in 11 days. Further testing is in order for the well before it is placed on regular production. Officials estimate the well will make up to 300 barrels of 37 degree gravity crude on production.

Lance Creek continues the most active producing field in the Rocky Mountain area with 14 wells being drilled at this time. The field also showed a good producer this week when Continental Oil Company brought in Otto Rohlff 10, SW SW SE 31-36n-65w, on the western slope of the structure, for 80 barrels per hour on initial test from the Leo sand at 5449 feet. The well is flowing through ¾-inch choke on the 2½-inch tubing string.

Rapid progress is reported on Continental Oil Company's important wildcat on the North Geary Dome structure, in Natrona County, central Wyoming. McGrath 1, CNW SW 15-34n-78w, is making hole below 4720 feet, heading for Sundance horizons at around 7500 feet.

A flow of 4,000,000 cubic feet of gas from the Embar lime at 247-250 feet is reported in the Albert Development Syndicate's Boeke 1, SW NW 18-25n-79w, wildcat on the Albert Dome structure, in Carbon County, southern Wyoming. Samples of the gas were taken by the United States Geological Survey for analysis. The flow has been mudded off and the test is drilling ahead in a soft lime formation.

The first oil well completion in the Pondera field, Pondera County, Montana, for 1939 is reported in the Pondera Oil Syndicate's Haber 1, NE NW SE 17-27n-4w, which has reported oil and gas saturation in lime formations at 2020-25 feet and is preparing to acidize to increase the flow before completing. Operators have landed 7-inch production casing at 1949 feet and are waiting on cement to set before drilling in to test the well, which bottoms at 2034 feet.

Mountain States Completions

MONTANA

Company, Well and Location	Init. Prod. Bbls.	Depth
Glacier County (Cut Bank Field)—		
Glacier Prod. Co., Bannister 1, cnw ne 21-33n-5w	20	2923
Huber-Montana Corp., Hintrager 2, cnw sw 24-37n-5w	¶2½ & 60	2731
Texas Co., Section 9 Unit 7, cnw sw 9-32n-5w	100	2985
Toole County (Kevin-Sunburst Field)—		
Big West Oil Co., Dahlquist 12, nw nw ne 21-35n-2w	40	1837
WYOMING		
Natrona County (Cole Creek Field)—		
General, Government 1, nw nw se 21-35n-77w	500	8015
Sublette County (LaBarge Field)—		
Texas Co., State 3-E, sw nw 27-27n-113w	40	940

* Failures; † Junked; ¶ Million cu. ft. gas.

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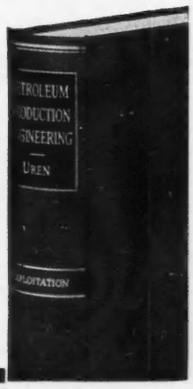

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Missouri

Gas discovery and new starts highlight month

St. Joseph, Mo.—Nine new starts were made in the Missouri sector of the Forest City basin during September; three in Platte County, two in Adair County and one each in Buchanan, Carroll, Clay, Daviess counties. Two dry holes were drilled, court action stopped one test, probably permanently, and three new locations were announced. One new test and one new location appeared in the Kansas sector of the basin; one new location in Iowa and one test and one location in Nebraska.

Of most significance was the opening of a gas pool five miles northeast of the town of Parkville in Platte County. Davis Brothers, drilling for the Missouri Valley Gas & Oil Company, were halted in an attempt to reach the Bartlesville sand when the drill hit an estimated 2,250,000 cubic feet of gas 12 feet in the Peru sand at 554 feet. This test, Brown 1 in SW NE SW 7-51-33, ran 2-inch tubing and rig was moved 1500 feet south for the Brown 2, in the same section, where the Bartlesville again will be sought, the operators hoping for heavier pay.

Thirteen hundred feet northeast of the Brown 1, Breen 1 in the same section produced 800,000 cubic feet at 618 feet, also in Peru sand. This test likewise was stopped by the pressure. The Missouri Valley company has staked 20 locations on its structure.

Gas gauged at 1,904,000 feet was found at 600 feet in C. E. King's Vandereau 1, NE SW 18-55-31, Clinton County. This area is about 30 miles northeast of the Platte County pool. When gas blew in at the King well a piece of connection struck and killed Howard Sherman, 20-year-old son of the drilling contractor, H. H. Sherman of Iola, Kansas. Since that mishap the test has been shut down.

One of the new wells was spudded September 23 two miles from the city of St. Joseph in C SE SE 24-57-35. It is the F. C. Miller's Corrough 1, located through core drilling conducted by V. C. Dugan of Ponca City, Oklahoma.

Other new tests follow:

Adair County—Morrow and Rodgers' (Pittsburgh) Cooley 1, SE SE NW 33-64-17; Mississippi lime at 383 feet; setting 10-inch casing at 515 feet. J. W. Eddington's (Claremore, Oklahoma) Clark 1, NE SE 8-63-14; drilling below 110 feet. Carroll County—Stewart G. McArthur (Dallas) and V. K. LaMar (Kansas City) NW 22-55-23; spudded.

Clay County—Pabelo Development Company's Bartlett 1, NE 27-52-32; drilling below 300 feet.

Daviess County—Francis Oil & Gas Company's (Kansas City) Lewis 1, E½ NE SE 29-59-27; drilling below 220 feet.

New locations are:

Chariton County—L. E. Mummert's (Tulsa) Ricker 1, 25-54-20.

Livingston County—Chillicothe Syndicate, SW 15-56-23.

Randolph County—A. A. Ash and Buttram Petroleum Company, SE 14-55-13.

One of the two September failures was drilled in Andrew County, SE NW NE 34-60-35, northeast of Savannah. It was the Jones-Hyde's Holt 1, abandoned at 2200 feet after three showings, the best of which was at 1497 feet in the Ste. Genevieve. This formation corresponds to the rich McClosky of Illinois and is believed to be prevalent in northwest Missouri. Formerly geologists thought the state had little or none of it.

The other failure was in Putnam County where the Dittman-Clovis' Houston 1, NW SW NE 26-65-19, tried to acidize in the Arbuckle, but was prevented by water. Total depth, 1779 feet.

Court action involving drilling equipment threatened to wreck plans to renew work at the long-dark Wright's Turner 1 in NW NW 27-59-9, Shelby County.

Although oil men still are operating over a wide front in north Missouri, there is a tendency to swing to the northeastern part of the state. Drilling is shallower there and one test has been so promising that other men have gone in. That is the Mayson Oil Company's McGonigle 1 in Adair County, NW 20-63-13. At 1190 feet it had the best showing of the basin for Viola lime. Above that it had a good showing in the Cooper lime. Bottomed at 1430 feet, the test has plugged back to 1190, cemented five-inch pipe and now will gun-perforate it and acidize.

Other operators contend northwest Missouri, the deeper part of the basin, is the better place to look for production. Running exceptionally high, Brin & Nathan's Decker 1 in C NW NW 1-61-38 is one of of the northwest Missouri tests commanding attention at present. After bailing some free oil at 1005 feet, the test drilled to 1007, where caving began and the drill stem broke. This test has hit no water since setting surface casing, a condition unique to date in the Forest City basin. A 15-inch hole was reduced at about 800 feet to 12½ inches, but no more pipe was run.

Forest City basin tests have been finding the Hunton lime wet, but Davis Brothers drilled into it dry with their Minning 1 in SE SE NW 22-58-23, Livingston County. They picked up the lime at 783 feet, running 15 feet high, set pipe at 795 and now are drilling below 965 feet.

Nineteen Missouri wells are in various stages of drilling following spudding. Ten deep tests since spring have been dry holes. Several more drilling projects are shaping up rapidly and will be reported soon. Major company support continues to be rare, but is offered on occasion. There is evidence that the play, started by aggressive independents, will continue many more months.

Well-spacing program request

Tulsa.—A twenty-acre spacing program is being sought by Russell S. Patterson for the area recently discovered by a Hunton lime test in SE SW SW 27-5n-4e, Pontotoc County. The discovery well, Grisso Royalty Company and Eason Oil Company's Haskins 1, pumped 50 barrels in 20 hours, crude being 37 gravity and no water present. Patterson also requests this area be known as the Rixleben pool, until otherwise officially designated, as the common source of supply is not connected with any other area.

California Fields

Coles Levee indicated seven miles long

Los Angeles.—It now is believed that Coles Levee field, Kern County, is at least 7 miles long, based on the recent completion of Standard Oil Company of California's No. 21-1, which is yielding approximately 200 barrels daily from 9880 feet, although it is capable of producing much more. Coles Levee starts at the northeast edge of the Buena Vista Lake bed and curves westward, thence north and northwest around the end of Elk Hills to Tupman, where Standard's No. 2-1 is located. No. 21-1 is the so-called "pure gasoline producer" at Coles Levee and 6 other wells are being drilled to find the same highly productive zone. Standard is drilling 3 wells in the south and west portions of the field. On the north Richfield Oil Corporation is drilling 2 and has staked location for a third.

Wildcat Yields Gas

Southwest of Woodland, Yolo County, Standard Oil Company of California recently brought in a small gas well. Corcoran 1, situated in Section 29-9n-1e, was good for 6,500,000 cubic feet of gas per day from 3660-82 feet and is located on what is described by geologists to be a small Pliocene outcropping.

The results obtained by Meridian Petroleum Corporation's Fee 2, deep test in the proven portion of Fruitvale, were quite disappointing. Mostly salt water was brought to the surface following a try for production with bottom at 7665 feet, and there may be an attempt to carry this project deeper to take a look at the deeper horizon.

Richfield Oil Corporation is completing rig site for a wildcat well to be drilled on a block of 3540 acres, a portion of which is situated in Section 29-29-27, in the West Fruitvale area. This test, KCL 83-29, is expected to explore for the Vedder zone.

Tejon ranch in the southerly portion of the San Joaquin Valley is about to be tested again for commercial production—this time by the Richfield Oil

California Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
Los Angeles County (Montebello West)—		
R. R. Bush, Olds 2	650	7670
Standard, Braun 7	83	7645
Braun 8	280	7660
Los Angeles County (Newhall-Potrero)—		
Barnsdall, R.S.F. 6	230	7058
Los Angeles County (Wilmington)—		
Long Beach Oil Dev. Co., "X" (LB) 11	450	3873
Fresno County (East Coalinga Eocene Pool)—		
Robert S. Lytle, No. 86-7F	2175	8260
Kern County (Canal)—		
Ohio, KCL E-14	771	8325
Kern County (Fruitvale)—		
Western Gulf, KCL B-43	95	3826
Kings County (Kettleman North Dome)—		
K. N. D. A., No. 54-20Q	474	7500
Kern County (Rio Bravo)—		
Superior, Burner 1	3161	11,415
Los Angeles County (Playa Del Rey)—		
Vulcan Oil, Del Rey 1	*	7401
Los Angeles County (Torrance)—		
Blackwell & Sunode, Inc., Stevens 1	*	1003
Kern County (Poso Creek)—		
Crestmont Oil, McNell 1	*	2804
Kern County (Mt. Poso)—		
Ring Oil, Rodgers-Jones 5	*	1895

* Failures; † Junked; ¶ Million cu. ft. gas.

Corporation. Drilling operations are underway on Tejon Core Hole 1, south corner of Section 7-10-19, and it is expected to be a deep test. The initial project is located 3 miles southeast of KCL 1, a deep test recently suspended at Wheeler Ridge. It is the first to be started on a block of 55,000 acres leased by Richfield.

New Mexico Fields

Vacuum and Loco Hills areas get additional outlet

Hobbs, N. M.—Market relief and adequate pipe line transportation facilities will become available to the Loco Hills and Vacuum fields, important drilling centers for Eddy and Lea counties, respectively, within the current week. An outlet for 3000 barrels daily is to be given the Loco Hills area through completion of The Texas-New Mexico Pipe Line Company's extension from its Artesie district station. The line will handle the oil for the account of the Sinclair Prairie Oil Marketing Company for delivery to Houston. New Mexico Pipe Line Company also has a line in the field and is bidding for connections.

Second outlet for the Vacuum field is due to start handling crude by October 5. It involves a 20-mile 10-inch gravity trunk line built by The Texas-New Mexico Pipe Line Company to connect with its Monument field system. Magnolia Petroleum Company, largest producer with 62 wells, has arranged to absorb its own production which will be gathered by the company and transported by the above carrier on a common-carrier basis. The oil will be delivered to Magnolia Pipe Line Company at Wink, Texas, on a 5-cent per barrel tariff.

Lea County accounted for 9 new operations the past week, with 7 fields sharing in the work. Vacuum field gained 2 tests, including The Texas Company's State 3-L, near C SE NE 1-18s-34e, and on the south edge. Humble Oil & Refining Company's State 10-K, C SW SE 28-17s-35e, has also rigged up rotary. Magnolia Petroleum Company is maintaining 3 rigs in continuous service on its State-Bridges lease.

South extension for the west Eunice pool is to be sought by Wilson Oil Company's State-Shell 2, which is a south offset to a well showing for a natural-flowing producer from sandy lime at 3680-3736 feet.

Total wells in the Lovington pool increased to 19 with completion of Stanolind Oil & Gas Company and Amerada Petroleum Corporation's Caylor 1, C NW SW 6-17s-37e, flowing 87 barrels of oil in 12 hours after using 3000 gallons of acid at 4920 feet. Magnolia Petroleum Company's State 2-Q, which will require 3 direct offsets, pumped 112 barrels initial. It was drilled to 5100 feet then shot with nitro and acidized.

In the Penrose field, Lem Peters et al's State-Humble 1-H, NW NW SE 34-22s-37e has spudded with machine. It is on lease farmed out by Humble Oil & Refiing Company. Devonian Oil Company's Christmas 3, NW NW SE 28-22s-37e, is a new location.

Continental Oil Company's State 1-A-2, C SW SE 2-25s-37e, east edge test for the Langlie field, failed to yield oil in drilling through the pay zone to 3624 feet. The hole was plugged back to 3480 feet for nitro shot and acid for completion as a small gasser. In the Mattix area, Amerada Petroleum Corporation's Johnson 4, C SE SW 27-24s-37e, a new project, was drilling at 1880 feet.

New Mexico Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
Chaves County (Wildcat)—		
Meither et al, Smith 1, nw se se 30-11s-25e	†	795
Eddy County—		
Aston & Fair, Hudson 1, c ne ne 18-17s-31e	50	3533
Me-Tex Supply Co. et al, State 1, Acct. 2, nw nw nw 2-19s-31e	30	3683
Underwood & Sanders, Miller 2, sw nw nw 4-18s-29e	†	2405
Miller 3, se sw nw 4-18s-29e	90	3295
Lea County (Langlie)—		
Continental, State 1-A-2, c sw se 2-25s-37e	¶3.4	3624
Lea County (Lovington)—		
Amerada, State 3-A-L, c sw ne 1-17s-36e	478	4903
Magnolia, State 2-Q, c se ne 36-16s-36e	112	5100
Skelly, Caylor 1, near c nw ne 6-17s-37e	480	4955
Lea County (Mattix)—		
Humble, Williams 6, c ne nw 34-24s-37e	432	3500
Repollo, State 1-E, 157 sw sw ne 32-24s-37e	222	3540
Two States Oil Co., Calley 1-A, ne se sw 20-24s-37e	30	3635
Lea County (Monument)—		
Stanolind, Gilluly 5-B, nw ne nw 22-20s-37e	447	3860
Lea County (Penrose)—		
Peters et al, May-Repollo 3, sw sw ne 34-22s-37e	384	3655

Arizona Completion

Rincon Drilling Syndicate, State 1, 28-13n-27e	*	500

* Failures; † Junked; ¶ Million cu. ft. gas.

Auction of New Mexico oil leases set for October 26

A public auction of oil and gas leases on 760 acres of public land in the Fulger Basin gas field, New Mexico, will be held October 26 in the district land office at Santa Fe, it was announced September 20 by Commissioner Fred W. Johnson of the general land office at Washington, D. C.

The land will be offered for lease in two units of 280 and 480 acres, respectively, but the tracts may be consolidated in a single lease to a qualified bidder.

It was also announced that an auction of 120 acres of public land in the Osage oil and gas field, Wyoming, will be held October 24 in the district land office at Buffalo, Wyoming.

The leases are offered in accordance with the department's policy for conservation, to prevent loss to the government by depletion of the reserves through existing or threatened drainage by private drilling operations.

Well-spacing request

Tulsa.—James Doak and M. S. Hughes have requested ten-acre spacing for the Leach pool, Okfuskee County. Probable producing area lies in E½ 16- and W½ 15-10n-11e. Cromwell sand production is encountered at approximately 2845 feet. Others with leases in the vicinity are Minniehoma Oil Corporation, W. L. Kistler and Jarvis and Holmes.

Michigan Fields

Half-mile outpost test of Kent County field showing

Mt. Pleasant, Mich.—Two Traverse tests, one a half-mile extension and the other a semi-wildcat, held promise this week of opening up new territory for development southeast of the developed Kent County field.

Hogan Brothers' Alabastine 1, SW NW NW, Section 1-6n-12w, ½-mile east of production, showed 500 feet of oil in open 6-inch hole and was under test early this week after the pay had been mudded off and a 6-inch casing string set at 1845 feet.

William Alexander Trustee's Rodenhouse 1, NE SE SE, Section 14-6n-12w, Whoming Township, a semi-wildcat, flowed 100 barrels by heads over a six-day period from Traverse at 1896 feet before casing had been run. The Rodenhouse test is 2 miles southeast of the developed Kent field and about ½ mile southeast of a 10-barrel pumper drilled several months ago.

Continued drilling on the northwest side of the Temple field, Clare County, also was indicated, when the Pure Oil Company's Sparrow-State 2, SW SE Section 29-19n-6w, Redding Township, initialed 2211 barrels natural from Monroe lime at 3859 feet.

Michigan Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
Allegan County—		
Mee & McKennas, Rhodes 1, nw ne nw 32-2n-15w	*	1440
Redman Oil Co., Heibel 2, se se se 2-4n-13w	150	1642
Gordon Oil Co., Miller A2, nw nw ne 10-4n-13w	350	1606
Voorhees Oil Co., Schumacher 1, sw nw nw 12-4n-13w	200	1587
Salem Gas & Oil, Smith 4, nw sw nw 23-4n-13w	130	1583
Arenac County—		
Don Rayburn, Hobart 1, c ne ne 9-20n-4e	¶¼	1160
Clare County—		
Taggart Bros., Haley 1, c se 29-18n-6w	*	1553
Pure Oil Co., State-Sparrow 2, c n sw se 29-19n-6w	2200	3859
American Dr'lg., Newcomber 6, s se ne 32-19n-6w	650	3889
McClanahan Oil Co., State 3, nw nw sw 33-19n-6w	900	3891
Turner Pet. Co., Wheeler 3, c w e nw 34-19n-6w	606	3922
Isabella County—		
Pure, Wille 15, c s ne ne 4-14n-6w	240	3620
Kent County—		
C. J. Neal, Robinette 1, sw se ne 34-8n-11w	*	2208
C. C. Goff, DeVos 1, sw sw nw 19-7n-12w	*	1990
Fisher & McCall, Beaumont 1, c e se nw 29-7n-12w	500	1927
Smith Pet. Co., O'Sullivan 1, sw se sw 30-7n-12w	300	1874
M. L. Jorgensen, Schouwink 1, se se ne 30-7n-12w	500	1916
Smith & Stroms, Sullivan 1, sw ne sw 30-7n-12w	350	1875
Weller & McKays, Fee A-1, c s½ se nw 30-7n-12w	450	1939
Certainteed Prod. Co., Fee 2, ne se ne 4-6n-12w	900	1775
Rex Oil Co., Land Co. 1, sw nw ne 3-6n-12w	75	1790
Pyramid Oil Co., Stiles 3, ne se se 4-6n-12w	370	1772
Lamar Oil Co., Gravel Co. 3, sw nw se 4-6n-12w	600	1867
Monroe County—		
Bridger Basin, Dusseau 1, sw se nw 19-6s-6e	30	2145
Ottawa County—		
Sohio Prod. Co., Hilzey 1, nw sw sw 24-5n-13w	*	1795
E. B. Strom, Park 2, ne se se 25-7n-13w	325	1862
Roscommon County—		
R. D. Kirkham, Neer 1, nw se sw 26-24n-4w	*	3253
Van Buren County—		
Blood & Hendershott, Westcott 2, ne sw ne 28-2s-16w	30	1039
Consolidated Dev. Co., Ford B-1, nw se sw 12-1s-15w	384	1186
Clapsaddle et al, Willerton 1, ne nw ne 23-1s-15w	25	1206

* Failures; † Junked; ¶ Million cu. ft. gas.

WILDCAT REPORT
New Starts and Completions

STATE	WILDCATS STARTED		WILDCAT TESTS COMPLETED							
			Total		Oil		Gas		Dry	
	This Week	This Year	This Week	This Year	This Week	This Year	This Week	This Year	This Week	This Year
Alabama	1	5	...	2	...	...	...	...	...	2
Arkansas	1	28	...	18	...	2	...	...	...	16
California	4	167	...	76	...	20	...	2	...	54
Colorado	...	2	...	1	...	...	...	...	...	1
Florida	...	3	...	1	...	...	...	...	...	1
Georgia	...	3	...	1	...	...	...	...	...	1
Illinois	4	453	27	351	1	26	...	2	26	323
Indiana	1	48	1	30	...	9	...	1	1	20
Kansas	6	193	7	186	1	51	1	9	5	126
Kentucky	...	39	1	23	1	8	...	...	...	15
Louisiana	4	105	3	79	1	13	...	3	2	63
North Louisiana	2	35	1	24	...	3	...	1	1	20
South Louisiana	2	70	2	55	1	10	...	2	1	43
Maryland	...	1	...	...	...	...	...	...	...	...
Michigan	7	199	3	254	...	18	...	...	3	236
Mississippi	2	15	...	9	...	1	...	...	...	8
Missouri	1	49	3	22	...	...	2	2	1	20
Montana	1	3	...	2	...	...	...	...	...	2
Nebraska	...	1	...	...	...	...	...	...	...	1
New Mexico	1	32	1	20	...	1	...	1	1	18
New York	...	1	...	4	...	1	...	1	...	2
Oklahoma	1	132	1	136	1	18	...	6	...	112
Ohio	...	4	...	10	...	1	...	...	...	9
Pennsylvania	...	3	...	5	...	...	...	...	...	5
South Dakota	...	2	...	2	...	...	...	...	...	2
Texas	19	817	21	894	1	84	...	15	20	795
East Texas	...	98	4	86	...	3	...	1	4	82
North Texas	3	106	5	173	...	26	...	1	5	146
Gulf Coast	...	...	1	84	...	75	...	6	1	69
Panhandle	...	8	1	8	...	...	...	...	1	8
South Texas	13	368	4	403	...	33	...	10	4	360
West Texas	3	154	6	148	1	16	...	2	5	130
Utah	...	1	...	...	...	...	...	...	...	...
West Virginia	...	2	...	1	...	...	...	...	...	1
Wyoming	...	5	...	3	...	...	...	...	...	3
Total U. S.	53	2,315	68	2,134	6	253	3	40	59	1,841

ALABAMA

FIRST REPORTS

Washington County—Texon Drilling Co.'s Stallworth Naval Stores Co. 1, located 115 ft n and 63 deg. e of Danciger's Avant 1, sec 25-5n-4w, dr 2705 ft.

ARKANSAS

FIRST REPORTS

Columbia County—Lion O. R. Co.'s R. S. Warnoch 1, nw nw 15-18-22, dk (second test for new Dorcheat-Experment field).

CALIFORNIA

FIRST REPORTS

San Diego County—L. J. Waterbury's Capitol 1, swc Pueblo lot 1237, sec 32-15s-3w, Rose Canyon area, rig.

Kern County—H. C. Trigg's No. 1, sec 11-25-18, Devils Den area, lcn.

Ventura County—Harry Rilling's No. 1, center 13-3-21, South Mountain, lcn.

Merced County—Seaboard-T. W. A. Union's Howard 1, swc 6-8-11, Los Banos area, lcn.

INDIANA

FIRST REPORTS

Gibson County—Roberts Bros.' Keck 1, ne ne nw 34-3s-14w, dk. Paul Doran's Mauck-Benson 1, nw se nw 27-2s-12w, dk.

COMPLETIONS

Posey County—Ray Ryan & Morgan Brown's Wolf 1, c se sw 30-7s-14w, top Ste. Genevieve 2779 ft, abnd 2937 ft.

ILLINOIS

FIRST REPORTS

Edwards County—Rosch & Voyles' A. Lee 2, c n½ ne se 11-1s-10e, Shelby tnp, dr 3000 ft.

Gallatin County—Bert Fields' C. H. Logan 1, se sw se 19-9s-9e, Gold Hill tnp, dr.

Pope County—Gardenhire & Smith's Peoples 1, c se se 19-11s-5e, Union tnp, dr.

Randolph County—Ralston & Beattie's L. C. Foster 1, c ne se 31-4s-5w, Sparta tnp, dr.

COMPLETIONS

Adams County—L. C. Robinson et al's W. C. Fowler 1, ne se se 12-2n-5w, Northeast tnp, abnd 1003 ft.

Bond County—E. J. Goldschmidt's Simon Plog 1, nw nw se 8-5n-4w, Ripley tnp, abnd loc.

Clark County—Leatherman's Tyrhurst 2, sw sw se 26-9n-14w, Johnson tnp, abnd after spudding to 50 ft, Scharp & Stipes' J. C. Sharp 1, c n ½ nw ne 31-10n-13w, Martinsville tnp, abnd after spudding to 46 ft. Jinks' W. A. Johnson 1, sw nw nw 36-10n-14w, Casey tnp, abnd 535 ft.

Clinton County—Williams et al's Dunn 1, sw nw ne 1-1n-1w, Brookside tnp, top Bethel 1320 ft, abnd 1342 ft.

Crawford County—Downey & Connor's W. N. Cockran 1, se se nw 12-5n-12w, Honey Creek tnp, completed in Pennsylvanian sand at 962 ft with initial pumping production of 6 barrels oil in 24 hours.

Douglas County—Lewellen & Phillips' Kennedy Bros. 2, sw se nw 34-16n-9e, Camargo tnp, abnd 401 ft.

Edwards County—Dye et al's Chas. Lemke 1, c ne nw 4-1n-14w, Salem tnp, top Levias 3053 ft, abnd 3185 ft.

Gallatin County—Vandenback's Busick 1, se se nw 11-8s-10e, New Haven tnp, top Cypress 2362 ft, abnd 2454 ft.

Jefferson County—Petrie, McCracken et al's S. M. Roper 1, ne nw se 9-1s-1e, Grand Prairie tnp, top Ste. Genevieve 2230 ft, abnd 2352 ft. Transcontinental Oil Co.'s Carrol 1, se ne se 16-2s-1e, Casner tnp, top McClosky 2256 ft, abnd 2279 ft. Magnolia Petroleum Co.'s M. C. Davis 1, ne nw se 22-3s-2e, McClellan tnp, top McClosky 2764 ft, abnd 3066 ft.

McDonough County — L. G. Kellar's (Chrysl's) C. E. Wright 1, se se se 16-7n-4w, Blandinsville tnp, abnd 677 ft.

Madison County—Erie Drilling Co.'s Kaseburg 1, sw se se 2-3n-9w, Nameoka tnp, abnd 1420 ft.

Montgomery County—W. M. Meyers' Redman 1, se se ne 29-9n-2w, Witt tnp, abnd loc. Jack S. Brown's C. W. Hefley 1, sw se se 4-9n-3w, Irving tnp, top Salem 1285 ft, abnd 2106 ft.

Perry County—J. J. Brodice et al's Roundtree 1, sw sw se 29-4s-7w, Tamaroa tnp, top Bethel 1289 ft, abnd 1385 ft. Pres. Cochrane's Geacomo 1, nw nw nw 34-4s-3w, Pinckneyville tnp, top Ste. Genevieve 1565 ft, abnd 1619 ft. E. J. Shaefer's F. Sprague 1, sw ne nw 33-5s-4w. Cutler tnp, abnd 1400 ft.

Richland County—Leathers et al's Roy Malone 1, ne nw ne 21-3n-14w, Claremount tnp, top Tar Springs 2555 ft, abnd 2585 ft. Pure Oil Co.'s Lillie J. Coen 1, c e½ se ne 2-4n-9e, Denver tnp, temporarily abandoned after drilling through Cypress and McClosky.

St. Clair County—Gladiator Oil Co.'s C. Hoffstetter 1, c n½ ne se 35-1n-10w, Sugar Loaf tnp, abnd 630 ft. W. B. Greer's Fullmer 1, se se ne 27-2s-7w, Athens tnp, abnd 220 ft.

Schuyler County—O. A. Reed's J. P. Long 1, se se se 28-1n-2w. Woodstock tnp, top Trenton 686 ft, abnd 877 ft.

Shelby County—Fletcher et al's Hellick & Willard 1, nw ne se 9-10n-4e, Clarksburg tnp, top Fredonia 1950 ft, abnd 1993 ft.

Wayne County—Cuyuna Corp.'s Caldwell 1, c e½ ne sw 3-1s-8e, Jasper tnp, abnd loc.

KANSAS

FIRST REPORTS

Barton County—Aylward et al's Harzman 1, c w½ nw sw 33-16-11w, lcn. Seaney et al's Schauf 1, csl, e½ sw 1-16-12w, lcn.

Cowley County—Brosius et al's Rahn 1, swc nw 13-34-5e, surface pipe.

Douglas County—Greenway's Grosdedier 1, cel se ne 24-13-20e, dr.

Rice County—Schneider et al's DeWeese 1, swc ne 30-20-7w, rig. Broderick et al's Kowalsky 1, c e½ se ne 30-20-11w, surface pipe.

COMPLETIONS

Butler County — Crown Petroleum Co.'s Manny 1, nwc se 33-28-5e, ¾ mi w Fox-Bush pool, top Bartlesville 2767 ft, td 2775 ft, shot 40 quarts, 75 bbls.

Cowley County—Wakefield et al's Starkey 1, sec ne 32-30-4e, Darien pool, top Arbuckle lime 3316 ft, abnd 3322 ft.

Douglas County—Three Star Oil Co.'s Griffith 1, c nw se 4-14-18e, 3 mi w Lone Star, top Arbuckle lime 2100 ft, abnd 2116 ft.

Johnson County—Willinbring et al's Ramey 1, nwc sw 17-15-23e, completed, 7 mi n Paola pool, top sand 600 ft, td 915 ft, pb 610 ft, 200,000 cu ft gas.

Rice County—Hollow et al's Guldner 1, c e½ se se 5-18-9w, 1¼ mi n Gouldner pool, top Lansing 2918 ft, top Arbuckle 3282 ft, td 3288 ft, abnd.

Russell County—Phil-Han Oil Co.'s Mai 1, c n½ s½ ne 34-14-14w, w Michel pool top Conglomerate 3208 ft, abnd 3286 ft.

Wyandotte County—Gatton et al's Dunlap 1, nw ne nw 7-11-23e, Bonner Springs gas pool, abnd 695 ft.

KENTUCKY

COMPLETIONS

Henderson County—M. Grubb's T. Cooksey 1, c nw se 19-Q-25, deepened from 2240 ft, had McClosky 2216-30 ft, acidized 1000 gals, pumped 3 bbls oil and 30 bbls water in 24 hrs, td 2245 ft.

NORTH LOUISIANA

FIRST REPORTS

Caddo Parish—Ark. Fuel Oil Co.'s Bell et al 1, located 1067 ft e and 1213 ft n swc 6-17n-16w, rig.

Sabine Parish—W. E. Manas' Stevens 1, c sw ne 17-9n-11w, moving in materials.

COMPLETIONS

Franklin Parish — Continental Oil Co.'s Sherrouse 1, se ne se 22-13n-8e, elev 87 ft, gas blowout at 1252 ft, top salt 1778 ft, abnd 1839 ft.

SOUTH LOUISIANA

FIRST REPORTS

Assumption Parish—Shell's Ellis 1, Amelia Prospect, 3040 ft s, 265 ft w of ne c of sec. 69-16s-14e, lcn.

Jefferson Davis Parish—Housh & Thompson's Lacassine Co. 1, Hayes prospect, center of sw¼ of nw¼ of sw¼ of sec 29-11s-5w, lcn.

COMPLETIONS

Lafourche Parish—Mikton Oil Co.'s Martinez 2, Lafourche Crossing prospect, sec 132-15s-17e, perf. 10,134, comp 312 bbls 39.9 gravity oil daily, 5/32-inch choke, tp 1980 pounds, cp 1250 pounds.

St. Tammany Parish—Honey Island Dev. Co.'s Forbes 1, Honey Island Prospect, 1610 ft e of w line and 2250 ft s of n line of sec 33-7s-15e, abnd 100 ft.

MICHIGAN

FIRST REPORTS

Allegan County—Shimmel Trustee's Brandt 1, ne nw ne 28-3n-15w, lcn. DeVries & Boeves' Forrester 1, ne sw sw 15-3n-16w, rig.

Kent County—R. E. King's Zahm 1, nw nw 31-8n-12w, rig. W. H. Thourlby's Doyle 1. nw se se 6-7n-9w, rig.

Ottawa County—Daily Crude Oil Co.'s Herman 1, nw nw ne 11-8n-14w, dr.

Van Buren County — Westbrook Drilling Co.'s Hess 1, se se sw 9-3s-15w, rig.

Wexford County—G. H. Schrack's Busker 1, sw sw 7-22n-9w, lcn.

COMPLETIONS

Allegan County—Mee & McKennas' Rhodes 1, nw ne nw 32-2n-15w, Traverse 1198 ft, abnd 1440 ft.

Ottawa County—Sohio Producing Co.'s Hilzey 1, nw sw sw 24-5n-13w, Traverse 1762 ft, abnd 1795 ft.

Roscommon County—R. D. Kirkham's Neer 1, nw se sw 26-24n-4w, Dundee 3147 ft, abnd 3253 ft.

MISSISSIPPI

FIRST REPORTS

Hinds County—G. Jeffrey's Gaddis-McLaurin 1, located 150 ft e and 274 ft s nw sw 17-7n-2w, dk (6000-ft test on 8000-ac block).

Yazoo County (Tinsley Dome) — O Brien Bros. et al's Jennie Stevens 1, c se ne 13-10n-3w, rig up.

MISSOURI

FIRST REPORTS

Daviess County—Francis Lovis 1, c e½ ne se 29-59n-27w, dr.

COMPLETIONS

Andrew County—Jones et al's Holt 1, se nw ne 34-60n-35w, 2 mil ne Savannah, top Hunton 1880 ft, abnd 2200 ft in Hunton.

Platte County—Missouri Gas & Oil Co.'s Brien 1, swc ne 7-51n-33w, 5 mi e Parkville gas pool, top Peru 592 ft, td 617 ft, 750,000 cu ft gas. Missouri Gas & Oil Co.'s Brown 1, sw ne sw 7-51n-33w, 5 mi e Parkville gas pool, top Peru 542 ft, td 554 ft, 2,500,000 cu ft gas.

MONTANA

FIRST REPORTS

A. B. Cobb-The Texas Co.'s Bilsted 1, cnw se 4-36n-5w, 4 mi southwest of the Darling pool in the North Cut Bank area, Glacier County, lcn.

NEW MEXICO

FIRST REPORTS

Chaves County—G. H. Cowden et al's Brunson 1, nw nw nw 27-9s-30e, mim.

COMPLETIONS

Chaves County—Meither et al, J. W. Smith , nw se se 30-11s-25e, jkd 795 ft, skid 10 ft south and mim.

OKLAHOMA

FIRST REPORTS

Pontotoc County—C. Marchant's Williams 1, swc ne 8-4n-5e, rur.

COMPLETIONS

Pontotoc County—Grisso Royalty Co. et al's Haskins 1, se sw sw 27-5n-4e, 1½ mi w Beebe pool, top Hunton lime 2,476 ft., acidized 3000 gals, td 2639 ft, 50 bbls, 37 gr.

EAST TEXAS

COMPLETIONS

Camp County—Harry S. Moss et al's Mrs. Abbie Blackstone 1, 330 ft out of nwc 85½-acre tract, or 3250 ft from e and 3100 ft from n lines of E. B. Davis sur, elev 413 ft, Pecan chalk 2550-3060 ft, Austin chalk 3780-3884 ft, top Woodbine 4200 ft, abnd 4600 ft.

Ellis County—Ellis County Drl. Co.'s Trinity University 1, 3700 ft from e and 250 ft from s lines of P. D. Lowe sur, 2 miles e of Midlothian, abnd 563 ft.

Falls County—M. A. Hayes et al's D. G. Wooten 1, J. Powell sur, 8 miles se Lott, elev 385 ft, Pecan chalk 373-518 ft, Austin chalk 1483-1622 ft, top Buda 1831 ft, top Georgetown 1938 ft, abnd in Edwards 2126-37 ft.

Houston County—Aloco Oil Co.'s Z. W. Weisinger 1, 850 ft from n and 760 ft from se lines of 84.4-acre tract and T. H. Barrow sur, 7 miles sw Elkhart, elev 387 ft, Pecan chalk 4337-4720 ft, Austin chalk 5449-5734 ft, top Woodbine series 6004 ft, top sand 6023 ft, tested sw and abnd 6034 ft.

NORTH TEXAS

FIRST REPORTS

Archer County—H. H. Fraser et al's W. M. Coleman 1-A, 450 ft out of swc lot 24, Brazos C.S.L. sur, A-18, 3 mi n Scotland, dr 550 ft.

Clay County—E. N. Costley et al's W. A. Henderson 1, 1920 ft from e and 860 ft from s lines of D. E. Brannon sur, A-37, 3 mi s Charlie, lcn for 1400-ft test.

Wise County—C. A. Johnston et al's J. C. Vance 1, 1320 ft w and 380 ft s of swc sec 35, T&P sur, but in T&P sec 37, A-841, 6½ mi s Paradise, rig for 1200-ft test.

COMPLETIONS

Clay County—Youngblood-Foree & Ramsey Pet. Corp.'s Wynn 1, 330 ft out of sec nw sec 2, G. Gowan sur, A-795, top Home Creek 1620 ft, top Smithwick shale 5710 ft, top Bend 5856 ft, top Ellenberger 6063 ft, abnd 6070 ft.

Cooke County—Jim Anderson et al's J. H. Coursey 1, 330 ft out of sec of south 153-acres of W. H. Henderson sur A-1205, abnd 2065 ft.

Grayson County—John Gray et al's Freeman 1, 1900 ft from s and 1000 ft from e lines of W. S. Reeves sur A-1016, abnd 1407 ft.

Jack County—Cowboy Evans et al's Knox C. S. Lands 1, 920 ft from n and 1320 ft from w lines of D. Rathburn sur A-1763, abnd 470 ft.

Young County—M. L. Massingill et al's N. B. Carter 1, 990 ft from ne and nw lines of W. S. Kelly sur A-2258, abnd 3104 ft.

SOUTH TEXAS

FIRST REPORTS

Duval County—J. Brown Cutbirth's Hinojosa 1 (WC), 330 ft n line, 330 ft e line 80-ac tr, sur 4, lcn. J. Brown Cutbirth's Hinojosa 2, 330 ft n line, 990 ft e line of 80-ac tr, sur 4, lcn. H. B. Ownby Drilling Co.'s Hinojosa 1, 466 ft nw line and on ne line of sur 131, also, 466 ft nw line, 466 ft sw line of A. Perez tr, but in sur 131, lcn.

Jackson County—W. Sewart Boyle's Combs 2, 330 ft s line, 330 ft w line of 242.75-ac lse in sec 33, A. Kountz sur, lcn. Skelly Oil Co.'s Kunover 1, 702 ft nw line, 650 ft sw line and ne line of 80-ac tr (lots 17-32), blk 4, Schwind and Mahers first addition Francitas farms, Patrick Green sur, rigging up.

Jim Wells County—Gravis and Buescher's Charles and Lillian Muil 1, 330 ft n line, 330 ft w line of blk 5, J. Poitevent sur 201, lcn. H. H. Howell's Muzzy 1, 330 ft s line, 330 ft w line of lot 4, Whitman subd, Los Altos ranch, mim.

San Patricio County—Wellington Oil Co. of Delaware's Welder 2-B, 466 ft most w'ly w line, 566 ft s line in 2000-ac tr, Cayentano de la Garza gr, lcn still under water.

Starr County — Humble Oil and Refining Co.'s Montalvo 1, 605 ft s line, 1399 ft w line of n 492-ac of sur 237, lcn.

Victoria County—John Mayo's Stoner 1, 330 ft n line, 330 ft w line of 430-ac tr, Diego Garcia sur, lcn. Wellington Oil Co. of Delaware's Booth 1, 2260 ft se line, 2240 ft sw line, 2200 ft nw line, 2640 ft ne line of 480-ac tr, Indianola RR sur 10, ab-440, spud.

Webb County—Mayfair Oil Corp.'s Bruni 2, 330 ft s line, 330 ft e line of blk 75 "El Ranchito" tr, Jose Basquez Borrego gr, lcn. J. R. B. Moore's Billings 1, 330 ft s line, 330 ft w line of sur 13, lcn.

COMPLETIONS

Blanco County—H. C. McCart's Lester 1, (2nd hole), 1200 ft n line, 1000 ft e line of Antonio Band-Rando sur 161, in 5400-ac tr, sand with oil show, 370-85 ft, sand with oil show, 570-75 ft, top Ellenberger 385 ft, sd 675 ft.

Jim Hogg County—T. S. Scibienski, Tr.'s Downs Royalty 1, 330 ft sw line, 330 ft nw line of blk 34, Beer and Coffey subd of 2570-ac tr, El Javali gr, Cole sand, 996-1055 ft, top Cole 996 ft, abnd 2035 ft.

Starr County—Packer Petroleum Co.'s Guerra 1, 175 ft s line, 150 ft e line of blk 6, sh 253, porc 69, sand 1340-1408 ft, abnd 1617 ft. Coonan T. Wood, Wardner 3, 7131 ft n of RR, 150 ft w line of porc 84, Jurisdiction of Camargo, abnd 1806 ft.

TEXAS PANHANDLE

COMPLETIONS

Roberts County—E. J. Dunigan, Jr., et al's P. C. Ledrick 1, 1320 ft n and 1320 ft w of nwc E. L. Ry. sec 5, blk A-5, but in G&M sec 34, blk C, elev 2784 ft, abnd 5428 ft.

WEST TEXAS

FIRST REPORTS

Cochran County—D. P. Dean-C. Ed Hyde et al's D. C. Reed 1, 660 ft out of SEc sec 21, Harrison & Brown sur, rur for 5100-ft test.

Crockett County—Zay Kimberlin et al's J. W. Robbins-Superior 1, 2310 ft from n and 1650 ft from w lines GC&SF sec 4, blk B, mim.

Pecos County—H. H. Sides et al's Blackstone-Slaughter & Lackey 1, 250 ft from s and 1100 ft from w lines T. & St. L. Ry. sec 29, blk 129, lcn.

COMPLETIONS

Culberson County—Quito Oil Corp.'s Cameron Lumber Co. 1, c nw nw PSL sec 24, blk 81, elev 4077 ft, abnd 945 ft. L. G. Sheddan et al's S. J. Isaacs 1, center PSL sec 25, blk 52, elev 3471 ft, abnd 280 ft.

Dickens County—Andy Urban et al (was Hanson-Anderson s) C. D. Byrd 1, 330 ft from s and 1200 ft from w lines H&GN sec 290, blk 1, elev 2504 ft, abnd 3418 ft.

Gaines County—Stanolind's Rayner 1, c sw sw PSL sec 3, blk C-30, elev 3066 ft, top anhydrite 1970 ft, top salt 2060 ft, top Yates 2700 ft, top brown lime 3740 ft, top solid lime 4290 ft, top chert 4455 ft, pay 4661-4830 ft, tested little water, pb to 4770 ft, shot 615 qts nitro 4646-4760 ft, used 2500 gals acid, flowed 1279 bbls oil initial on air-gas lift.

Pecos County—E. R. Lloyd-Pen & Hargraves' Bonebrake-Ohio 1, 2310 ft from nw and 330 ft from ne lines H&GN sec 110, blk 8, elev 2486 ft, top anhydrite 835 ft, top lime 1463 ft, top Yates 1575 ft, abnd with hfw 1690-1727 ft.

Sutton County—Suttex O&G Co. (was Holland-Leidecker & Webb's) G. S. Allison 1, c se se GH&SA sec 44, blk K, elev 2381 ft, abnd 885 ft. Geo. Irvin et al (was Basse & Sackett's) W. A. Miers 1, c ne TW&NG sec 54, blk 14, elev 2307 ft, abnd 302 ft.

TEXAS GULF COAST

COMPLETIONS

Ft. Bend County—Woodland Oil Co.'s Berg 1, Needville area, 330 ft fr se line and 330 ft fr ne line of nw 80-acres of 160-acre tract, H. & T. C. No. 25, abnd 7410 ft.

Water flood permission asked

Tulsa. — Phillips and Milam have placed formal petition before the Oklahoma Corporation Commission for authority to prosecute a water drive recovery system. Tracts are located in Sections 25 and 26 of Township 26 north, Range 16 east, containing 490 acres. The operators have approximately 108 shallow pumping wells making an average of four tenths of a barrel per well per day.

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NOTES FOR THE Equipment Buyer and User

Unit Pumpers

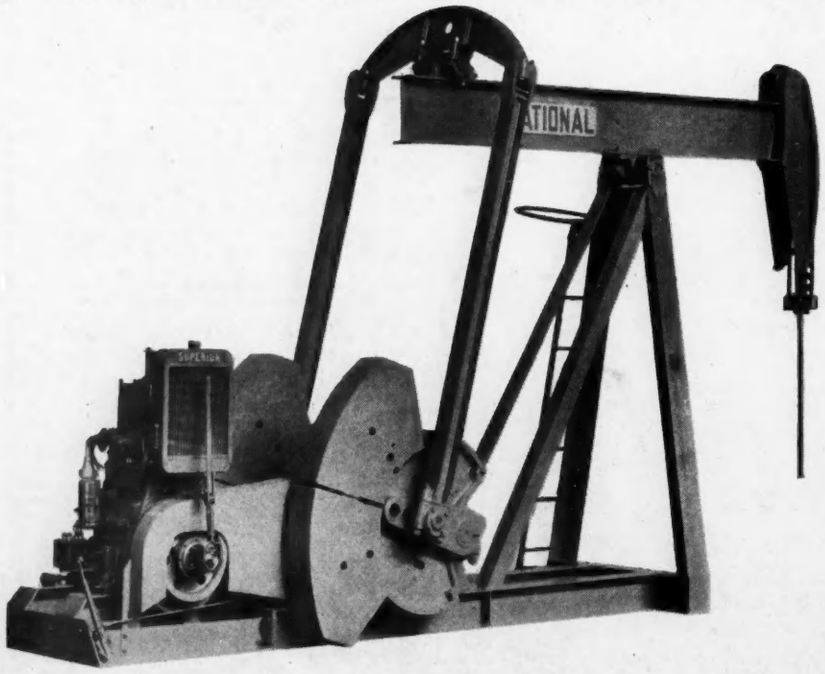
THE NATIONAL SUPPLY COMPANY

The National Supply Company, Toledo, Ohio, has recently added two new unit pumpers to its line. These two pumpers are known as the Types TU234-JD23TB and TU234G-JD23TP. They are designed for medium pumping service and are identical in design and capacity except for the cranks, counterweights and pitman assembly. Maximum polished rod stroke is 42 inches in each case and safe load of walking beam is 9,125 pounds A.P.I. The A.P.I. peak torque ratings is 57,200 pounds at 20 s.p.m. and overall gear ratio is 29.8.

The Type TU234-JD23TB Pumper has a fully equalized pitman assembly and is equipped with S.K.F. spherical roller bearing wrist pin housings. National Eccentric Disc Cranks and Counterweights give infinitely and continuously variable adjustability both in counterweight effect and degree of lag and lead. The counterweights are of the disc one-piece type, and are clamped in the desired positions on the circular rim of the crank. No lifting is required and the weights cannot slide off the cranks.

The Type TU234G-ID23TP Pumper is especially designed for installations where economy in first cost is of foremost consideration. Plain cranks with bronze bushed wrist pin housings are used and the pitman assembly is of the unitary instead of the equalized type. Beam counterweights installed in any increments from one to eight allow a wide range of counterweighting.

Aside from the individual features just described, the design of the two units is the same. Unusual resistance to vibration is provided by a strongly braced Samson post of the four-legged type welded integrally with the frame. A steel ladder with a ring type back rest allows safety and convenience for work at the beam level. The walking beam saddle and the beam pitman operate on roller bearings. Wide-faced single-helical gears, favorably proportioned and heat treated for long wear, are carried on well supported heat-treated steel shafts of ample size in Timken roller bearings. A complete description of these two units may be found in National Descriptive Bulletin No. 251.



National Pumping Unit

Arc Welder

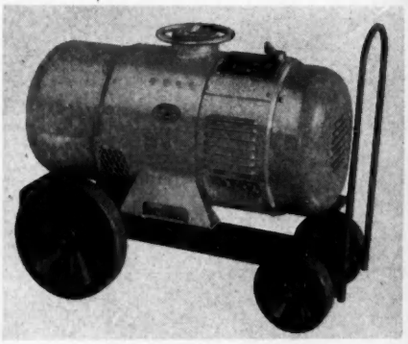
WILSON WELDER AND METALS COMPANY

A new single operator motor-generator arc welder, requiring only one control device for operation, has been announced by Wilson Welder and Metals Company, 60 East 42nd Street, New York.

Known as the Wilson "Hornet," this welding machine employs for its control a single, simple handwheel located on top of the unit. Adjustment of this handwheel permits the operator to obtain an infinite number of current settings. Dial markings are so accurately calibrated that meters are not required.

Single-pole control design assures a current output that will not vary, resulting in a constant, uniform arc at all times. Accidental reversal of polarity is impossible because the electric current is so designed that a small snap switch must be flicked by the operator to change the polarity.

The "Hornet" is a two-bearing unit, with motor rotor and generator armature mounted on a common shaft. Adequate ventilation is furnished by propeller blades attached to the revolving



Wilson "Hornet" Welder

shaft. Although shielded-arc electrodes are recommended, the "Hornet" will operate with equal efficiency where bare electrodes are used.

The Wilson "Hornet" is supplied in three sizes—Frame BA 200, rated 200 amperes; Frame BA 300, rated 300 amperes; Frame BA 400, rated 400 amperes.

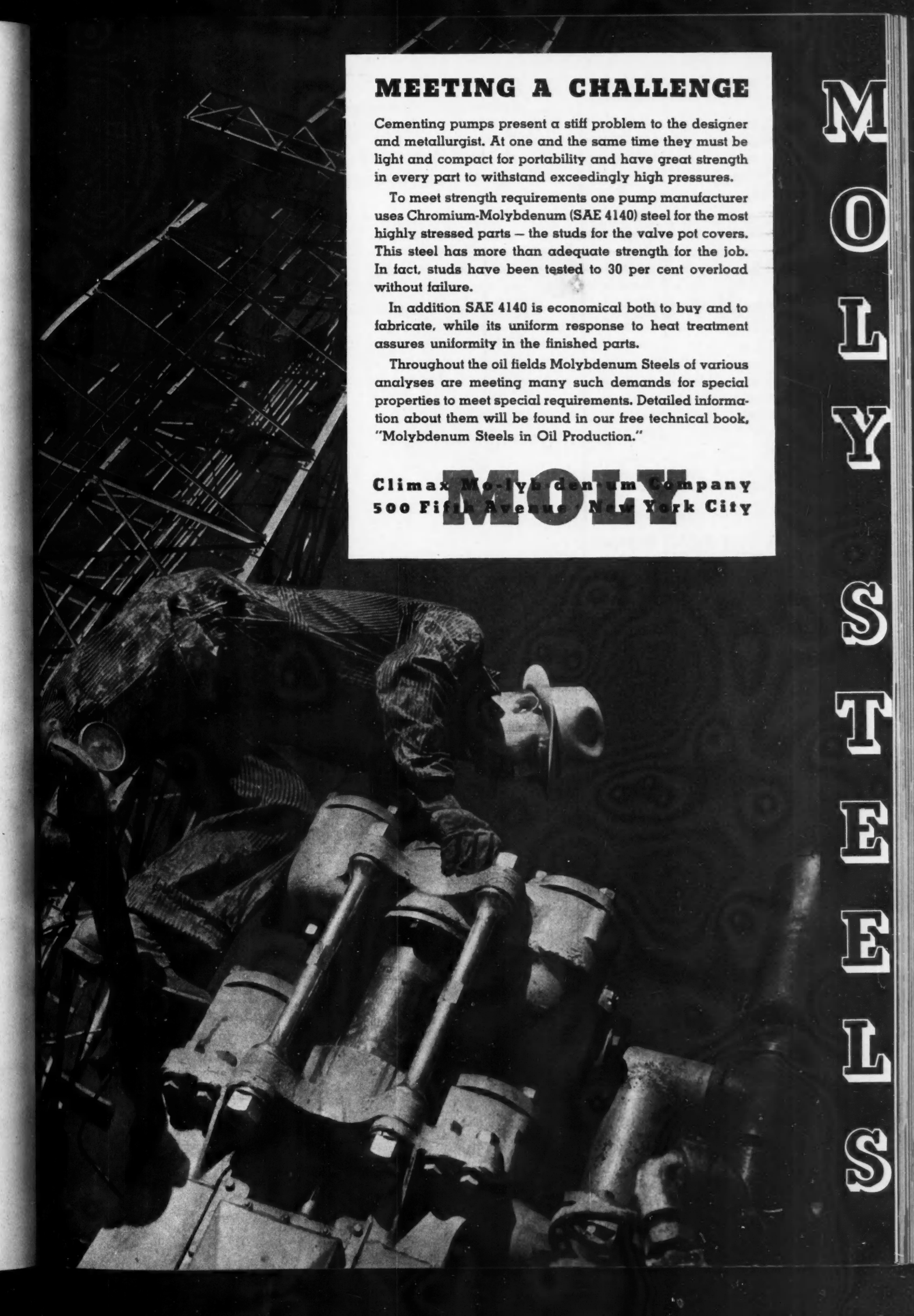
Tubing Control Head

CAMERON IRON WORKS, INC.

Cameron Iron Works, Inc., Houston, Texas, utilizing the basic principles of design of the popular Cameron Type CHR Control Head for high-pressure wells, has developed a new, low-cost ram type tubing control head to provide the ultimate in safe, positive control while drilling-in and completing medium pressure wells. This new control head has been designated as Cameron Type "LD."

As shown in the cross-section drawings herewith, the Cameron Type "LD" Control Head is unequally flanged to eliminate the need for an adapter spool between the control head and the casing head. Units are available in Series 600 API, 4000 pounds test pressure and Series 900 API, 6000 pounds test pressure. Flow outlets are provided above and/or below the rams as desired. The head may be flanged on the well as soon as pressure has been relieved on the oil string. Flow connections may be installed back to the separator and tanks immediately, while waiting on cement to set. All drilling-in and completion operations may then be conducted through the body of the Type "LD" Control Head.

Provision is made for several types of tubing suspension, depending upon the manner in which the well is to be completed. Tubing may be suspended on a special hanger nipple as illustrated herewith; it may be suspended on a



MEETING A CHALLENGE

Cementing pumps present a stiff problem to the designer and metallurgist. At one and the same time they must be light and compact for portability and have great strength in every part to withstand exceedingly high pressures.

To meet strength requirements one pump manufacturer uses Chromium-Molybdenum (SAE 4140) steel for the most highly stressed parts — the studs for the valve pot covers. This steel has more than adequate strength for the job. In fact, studs have been tested to 30 per cent overload without failure.

In addition SAE 4140 is economical both to buy and to fabricate, while its uniform response to heat treatment assures uniformity in the finished parts.

Throughout the oil fields Molybdenum Steels of various analyses are meeting many such demands for special properties to meet special requirements. Detailed information about them will be found in our free technical book, "Molybdenum Steels in Oil Production."

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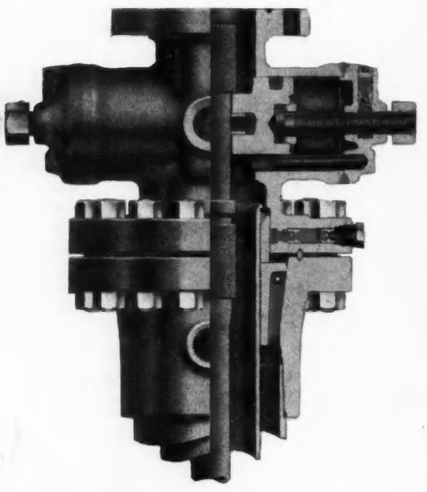

FIGURE 1

special hanger flange, or it may be suspended on slips in a manner similar to that used in Cameron Types ML, MH, RL and MR, Master Control Tubing Heads (see pages 503-4 of the 1939 Composite Catalog).

From the moment the tubing string is started in the hole, the Type "LD" rams provide quick, dependable blowout protection. Rams are equipped with self-feeding ram packing elements which assure a positive, pressure-tight seal, and permit sustained pipe movement under pressure, when necessary. On any rework or reperforating job, subsequent to original completion of a well, the ram type "LD" Control Head will be found extremely practical and convenient. Used in conjunction with a second Cameron ram type control unit, the tubing string may be raised or lowered, or pulled from the well under pressure without killing, if necessary.

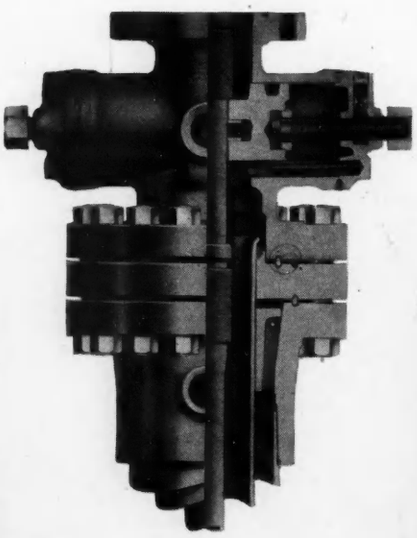

FIGURE 2

As illustrated in Figure 1, the Cameron Type "LD" Control Head is available with a unique means of sealing the annular space between casing strings. A Cameron Type "O" Slip Suspension Casing Head with welding bushing above the slips is illustrated in Figure 1. After casing has been suspended and welded to the bushing, the "LD" Control Head is installed and plastic packing is forced through a port in the lower flange, causing a moulded asbestos ring, recessed in the bore of the lower flange, to seal tightly around the welding bushing. Plastic packing ports are also provided around each ram thrust screw to effect a seal at those points and to obviate the need of conventional stuffing boxes. The use of plastic packing at these points makes it possible to repack under pressure at any time.

As shown in Figure 2, the Cameron Type "LD" Control Head is also available without the plastic packing feature in the lower flange for use above Cameron Types "M" and "J" Slip Suspension Casing Heads, or above any make of flanged casing head. Figure 2 illustrates the Cameron Type "J" Casing Head.

Stop Nut Catalog

The 1939 Catalog and Data Book of Elastic Stop Nut Corporation, 1015 Newark Avenue, Elizabeth, New Jersey, is now ready for distribution. This 56-page book explains graphically the Elastic Stop principle, whereby the nut is locked to the bolt through the action of a resilient non-metallic collar which eliminates all thread play between nut and bolt. Contained also are comparative test data, suggestions as to where Elastic Stop Nuts can be used to advantage, numerous illustrations of applications in various industries, and a complete listing of the standard nuts available.

Air Filters

Air-Maze Corporation, 5200 Harvard Avenue, Cleveland, Ohio, has published Catalog HI-79 on the function, construction, and industrial applications of both oil-bath and oil-film air filters for engine and compressor intake duty.

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STANDCO BRAKE LINING
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Standco Brake Lining Co
HOUSTON

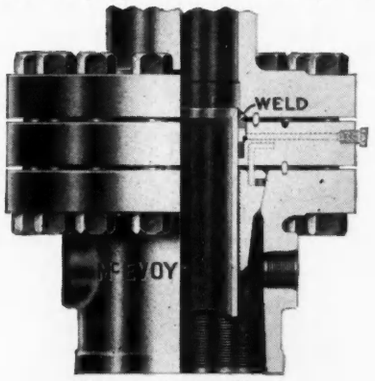
NOTES FOR THE Equipment Buyer and User

Casing Head

McEVOY COMPANY

A new high-pressure casing head featuring combined slip and construction weld support of pipe has been announced by McEvoy Company, Houston. This head includes a new welding flange which is bolted between flanges of the casing head.

After cementing, the casing is slacked off to the proper tension and slips are



McEvoy Casing Head

inserted to support the load. Slip handles and pipe are cut off with a cutting torch and the welding flange is then slipped over the pipe and temporarily bolted in place. The pipe is then sealed off with asbestos packing and welded to the welding flange.

The weld may be tested by applying pressure to the annular space between weld and packing, through a tapped hole in the welding flange. After testing, the temporary bolts holding the welding flange are removed and the next section of the Christmas tree is installed.

Among advantages claimed for the casing head are: Double pipe support—slips and welding, double seal—welding and stuffing box. It can be used with or without bored out preventers and there is no casing hanger spacer problem.

This casing head will support 10,000 to 15,000 feet of casing without bottlenecking pipe at slips. It is available to 10,000 pounds test pressure.

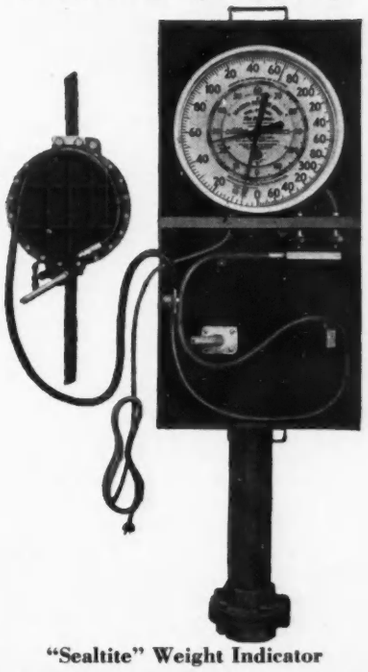
Weight Indicators

MARTIN-DECKER CORPORATION

Martin-Decker Corporation, Long Beach, California, has announced development of "Sealtite" Weight Indicators which eliminate the problem of fluid leaks even under the roughest drilling conditions. These indicators are permanently sealed at the factory and no further pumping or adjusting is necessary.

The "Sealtite" assembly consists essentially of two parts—the instrument itself and the diaphragm unit—both contained in a special steel box and permanently connected together with special reinforced high-pressure hose and steel fittings. All copper tubing and copper fittings have been completely eliminated in this new hookup. Installation procedure consists of clamping the steel case to a post in the usual manner, removing the diaphragm unit from the case and attaching to the dead line.

The "Sealtite" Weight Indicator gives direct readings in thousands of pounds as well as in points. It is indirectly illuminated for night work, and has an extra-large dial which can be easily read at 40 feet. The entire unit fits into the compact steel box, and can be readily moved from rig to rig whenever desired. It is instantly ready for use at all times without refilling or adjusting.



"Sealtite" Weight Indicator

All Martin-Decker Weight Indicators, including the Quintuplex Drilling Control, are available in the "sealtite" hookup for positive elimination of fluid leakage under all drilling conditions.

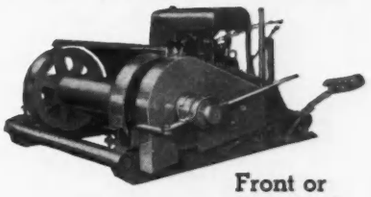
Feed-Water Heater

E. W. BANNON ENGINEERING COMPANY

The Bannon Feed-Water Heater, manufactured by E. W. Bannon Engineering Company, Houston, is a light, easily portable, yet ruggedly built unit designed to stand up under the rough treatment to which it may be subjected. According to the manufacturers, this new type heater will greatly eliminate boiler failures, and will increase both fuel economy and boiler efficiency.

The Bannon Heater utilizes exhaust steam for heating the boiler-feed water. Cold water is pumped to the heater by a pump mounted integrally with the heater, where it is sprayed over a distributing water ledge and rained down through a series of perforated trays. Steam enters the heater through a submerged oil separator, where oil is completely removed from the steam. The steam then flows through the trays in

BREWSTER
Model 46
V-8 Powered Winch



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Prepared under the Direction of a Sub-Committee of the Committee of Sedimentation of the Division of Geology and Geography of the National Research Council, Washington, D. C.
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This book is on the topic of Sedimentation and Environment of Deposition recently voted No. 1 in geological research of most importance to the progress of petroleum geology—in a poll of the 3,000 A.A.P.G. members and associates, conducted by the Research Committee. Throughout the book, the basic data — observational facts — are emphasized rather than speculative inferences.
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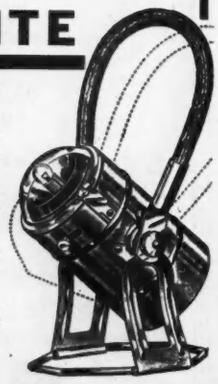
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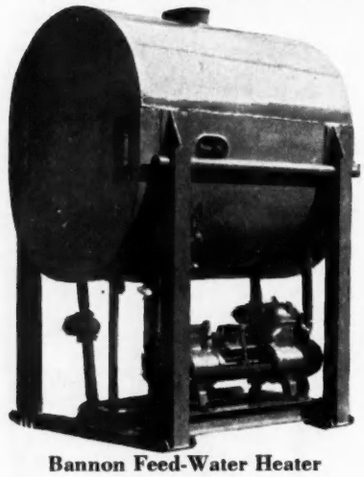

Bannon Feed-Water Heater

direct contact with the water. The water is supplied to the boiler at an average temperature of 210° F.

Mud, sand and other free solids are precipitated to the extent of over 80 percent, and as much as 20 to 30 percent of scale is removed in the heater, it is claimed. Actual tests are said to show a boiler fuel saving of over 11 percent, due to the use of this heater.

Cookston Joins Regan as Sales Representative

Regan Forge & Engineering Company announces that H. B. Cookston has recently joined its Mid-Continent division at Houston as sales representative.

Cookston has been active in practically all Mid-Continent and Eastern oil sections for the past 25 years, and during recent years has been with W-K-M Company of Houston

H. B. COOKSTON

D. R. Brown President of New O. C. S. Company

Douglas R. Brown, Coffeyville, Kansas, vice president of the firm since its organization 20 years ago, was elected president of Oil Country Specialties Manufacturing Company. He succeeds W. P. Turner, Long Beach, California, who retires. Other officers elected were Don C. Myers, Coffeyville, vice president and treasurer; B. M. Farson, Parkersburg, West Virginia, secretary, and Van Frey of Coffeyville, assistant secretary. Myers was formerly secretary-treasurer and Frey had been office manager.

Actual transfer of 59,230 shares of common stock of Oil Country Specialties Manufacturing Company was made to Parkersburg Rig & Reel Company following approval of the latter's stockholders. The transfer is said to have involved approximately $1,500,000.

DOUGLAS R. BROWN
President Oil Country Specialties Manufacturing Company

Oil Country Specialties Manufacturing Company and Parkersburg Rig & Reel Company will be operated as separate concerns and with a continuation of their present individual operating policies. Officials state the transaction will enable the two firms to better serve the oil and gas industry.

Oil Country Specialties Manufacturing Company operates manufacturing plants at Coffeyville, Kansas, Houston, Texas, and Long Beach, California. It is a pioneer in the manufacture of oil field equipment and specializes in drilling and pumping equipment.

The following directors were elected: D. R. Brown, John M. Crawford, B. M. Farson, D. C. Myers, and C. A. Ruf.

NOTES FOR THE Equipment Buyer and User

Crawford, Farson and Ruf are chairman of the board, secretary-treasurer and vice president-general manager respectively of Parkersburg Rig & Reel Company.

C. B. Morton will continue as district manager of Oil Country Specialties Manufacturing Company with headquarters at Tulsa.

Sand-Banum Appoints Service Machine & Iron Works

Western Sand-Banum Company, 703 M. & M. Building, Houston, Texas distributors for Sand-Banum products in the Gulf Coast territory, announces appointment of Service Machine & Iron Works, New Orleans, Louisiana, as its distributor in that territory. This new distributor will carry a full warehouse stock of "Sand-Banum" for control of scale and corrosion in boilers and engines.

Nowery J. Smith Distributor For Grant Oil Tools

Grant Oil Tool Company has appointed Nowery J. Smith Supply Company exclusive distributor.

New 24-hour service has been made available from the supply company's New Orleans, Rodessa, Shreveport and Corpus Christi plants, as well as from its Houston headquarters office.

Powell Manager for Union Wire Rope in Rocky Mountain Area

Union Wire Rope Corporation has announced the appointment of Evans Powell as district manager for the company in the Rocky Mountain Territory with headquarters at 26th and Walnut streets, Denver, Colorado. Powell has previously been with the company's central office staff, at Kansas City, Missouri.

EVANS POWELL

Rector Well Equipment to Have Foreign Representation

L. L. Rector, president of Rector Well Equipment Company, Fort Worth, Texas, announced appointment of Lucey Export Corporation, 3505 Woolworth Building, New York City, as export representative, following his recent return from a ten-day business trip to New York.

Lucey Export Corporation maintains foreign offices at Broad Street House, E.C. 2, London, England; Calle Defensa 320, Buenos Aires, Argentina; 58 High St., San Fernando, Trinidad, B.W.I.; and Str Vasile Lupu No. 13, Ploesti, Roumania.

Convertible Excavator

An impressive 24-page presentation of the features and operating advantages of the Buckeye Clipper Convertible Excavator has just been issued by The Buckeye Traction Ditcher Company, Findlay, Ohio. Special attention is given to the patented Buckeye "Mevac" Metered Vacuum Power Control System for all operatons.

Other details of design and construction are also covered fully and the adaptabilty of the machine shown by action pictures of jobs in progress. The Buckeye Clipper is built in three sizes—½-, ⅝-, and ¾-yard capacities, convertible to: shovel, trench hoe, crane, clamshell, dragline and pile driver. "Mevac" power control is used on all models.

Globe Oil Tools Literature

Globe Oil Tools Company, Los Nietos, California, has published Bulletin No. 11 on basket bits for coring, fishing, and hole straightening; Bulletin No. 12 on a safety finger which permits vertical movement of the fingerboard when fouled by the traveling block; Bulletin No. 14 on wire line coring equipment, with emphasis on specialized cutter heads, core barrels, and a special center bit for drilling through the core barrel without taking core.

New Developments in Instrument Transformers

A new line of instrument transformers is described in a 12-page booklet, B-2213, issued by the Westinghouse Electric & Manufacturing Company, Department 7-N-20, East Pittsburgh, Pennsylvania. In developing these units the aim has been to reduce cost, improve accuracy, and assure continuous service. All of them feature insulation coordinated with A.S.A. Standards.

Two new current transformers, particularly suitable for metering installations on networks, were designed to meet E.E.I. specifications. They are accurate to 150 percent load, have Hipernik cores instead of the usual silicon-steel cores, and are mechanically capable of carrying 250 times normal current.

A through-type current transformer, with a short-circuiting secondary block, has a high enough accuracy at heavy

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currents to make it possible to meter loads up to 1200 amperes by use of only two units. It is simple, small, easy to install and designed especially for use with watt-hour meters.

Two types of potential transformers, indoor and outdoor, are protected against impulse voltages by a new compound insulation and by stud-type bushings. Desirable features of a dry type transformer result, together with an insulation strength greater than that of the oil-filled type.

Several other instrument transformers are described, with their ratings and suitabilities for special jobs.

The booklet, B-2213, may be obtained from the Westinghouse Electric and Manufacturing Company, Department 7-N-20, East Pittsburgh, Pennsylvania.

Gasket Marker

Crane Packing Company, 1800 Cuyler Avenue, Chicago, has designed a handy tool for marking and outlining gasket sizes on sheet packing. This new marker eliminates the use of a pair of dividers and the necessity of referring to gasket tables or the taking of more than one measurement. All necessary information for marking gasket sizes is printed on the device, which may be had from the company.

It offers a handy, quick and convenient method for marking gaskets for extra heavy, medium standard and low-pressure flanges, both ring and full-face types. Other advantages claimed are that it saves time and waste of gasket materials. The device is easy to use and gasket dimensions can be marked quicker by its use than by any other method.

Frye Is Gulf Coast District Manager for Union Wire Rope

Union Wire Rope Corporation, Kansas City, Missouri, has announced appointment of H. E. Frye as district manager for the company in its Gulf Coast sales territory, with headquarters at Houston. Frye has been with the company as a salesman since its organization in 1926, serving first in the Kansas oil fields and later in the Portland, Oregon, district.

H. E. FRYE

It's a Fact — Johnston

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SHAFTS ARE CONSTRUCTED AND THE OIL IS COLLECTED IN VESSELS AS IT DRIPS FROM THE WALLS AND ROOF. AS OLD SHAFTS ARE DEPLETED NEW ONES ARE DEVELOPED AND THE OPERATORS ARE QUITE ADEPT AT DETERMINING PRODUCTION POSSIBILITIES BY PERSONAL INSPECTION OF THE FORMATIONS.

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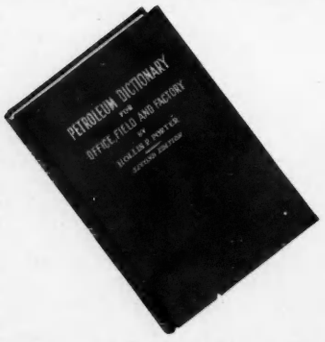

PETROLEUM DICTIONARY
By HOLLIS P. PORTER
A Registered Engineer

This work grew out of a demand for some source of definition for the terms used by the petroleum industry. It contains over 3,000 definitions of words used constantly by all phases of the petroleum industry. It was published in 1936 and has found its way into engineering departments, legal departments and land departments of producing concerns, as well as to the desks of executives of the petroleum industry.

Manufacturers also find it valuable for reference. Advertising agencies find it a valuable addition to the library.

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Squeaks from the Bull Wheel

Diplomat

She: "How old do you think I am?"
He: "You don't look it."

Reason Enough

There hasn't been much stirring around this cafe.
Why not?
Somebody stole all the spoons.

Looking for Work

"Do you happen to know where Ink Judson is just now?"
"Yassah! Yassah! Sho' does, sah! He's asleep dis minute over dar in de shade of de lumber yard lookin' for a job, sah."

What, No Dropping of Leaflets?

"What started the trouble?" asked the English judge.
"Well, yer honor, it was like this. 'E threw 'is beer over me. I 'ts 'im across the face wiv my bag of tools. Then 'e cuts my 'ead open wiv a bottle—an' the next thing we knows we find ourselves quarrelin'!"

Give Him a Chance

"My husband talks so much in his sleep. What shall I do with him?"
"Allow him to talk a little more during the day, Madam!"

Getting Closer

"Why do you call your boy friend 'Pilgrim'?"
"Because every time he calls he makes a little progress."

Contrasting Tastes

Dad did you ever hear anything as wonderful as the grand finale on that swing band program?
Can't say I did, daughter, unless it was a collision I once saw and heard between two trucks, one filled with empty milk cans, the other with several crates of live ducks on it.

Night Prowler

"What is your husband's average income?"
"Oh, about midnight."

Burned at the Stake?

"Hey, waiter, this steak is burned black."
"Yes, sir, a mark of respect; our head waiter died yesterday."

Theory vs. Experience

"The art in telling a story consists of knowing what to leave unsaid."
"It doesn't make any difference, my boy. My experience is that she finds out, anyway."

"Good Neighbor" Policy

A man entered a big store and made his way to the gardening department. "I want three lawn mowers," he said.
The clerk stared at him.
"Three, sir?" he echoed. "You must have a very large estate."
"Nothing of the kind," said the man grimly. "I have two neighbors."

Dangerous Place

"I've had my nose broken three times in the same place."
"You really ought to keep your nose out of that place."

An Eyeful

"Who was that peach I saw you with last night?"
"She wasn't a peach—she was a grapefruit."
"Why a grapefruit?"
"I squeezed her and she hit me in the eye."
"Hum, just a little squirt."

Example of Vegetarianism

"An exclusive vegetable diet would give you a trim figure."
"Did you ever take a good look at a hippopotamus?"

Some Specimen

"I'd like to look at a man's comb."
"You want a narrow man's comb."
"No, I want a comb for a fat man with rubber teeth."

Dates Mixed

"Do you love me, darling?"
"You know I do, Harry."
"Harry? My name's Sam."
"Of course! I keep thinking today is Monday."

Agreed

"Edison once said that four hours of sleep is enough for any man."
"That's exactly what my baby thinks."

Carried Unanimously

"Now if I were to be flogged, what would that be?"
"That would be corporal punishment."
"But if I were to be beheaded?"
"Oh, that would be capital."

Basis for Compromise

"I wish you would quit driving from the back seat."
"I will when you quit cooking from the table."

Final Test

"Funny no one seems to realize what a bad egg he was while he was rich."
"A bad egg is only known when it's broke."

Blocked Pass?

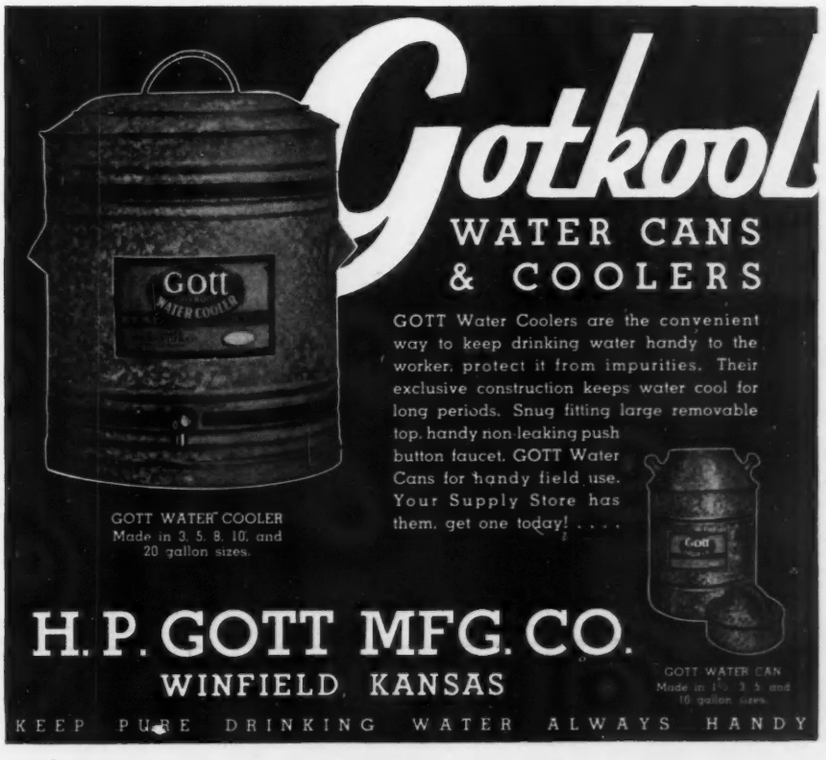
"Were you ever bothered with athlete's foot?"
"Yes, once when the captain of the football team caught me with his girl."

Too Good

The vacuum cleaner man, having finished his demonstration, turned with a beaming smile and showed the housewife the amount of debris which had been extracted.
"Oh, my goodness, isn't that awful!" said the woman. "I'll have to get rid of that carpet and put down linoleum."

Reversed Tastes

"How children's tastes do change."
"Yes, when my two were small, Johnny just loved soldiers and Mary was crazy for brightly painted dolls. Now Mary is crazy about soldiers and John runs after every painted doll he sees."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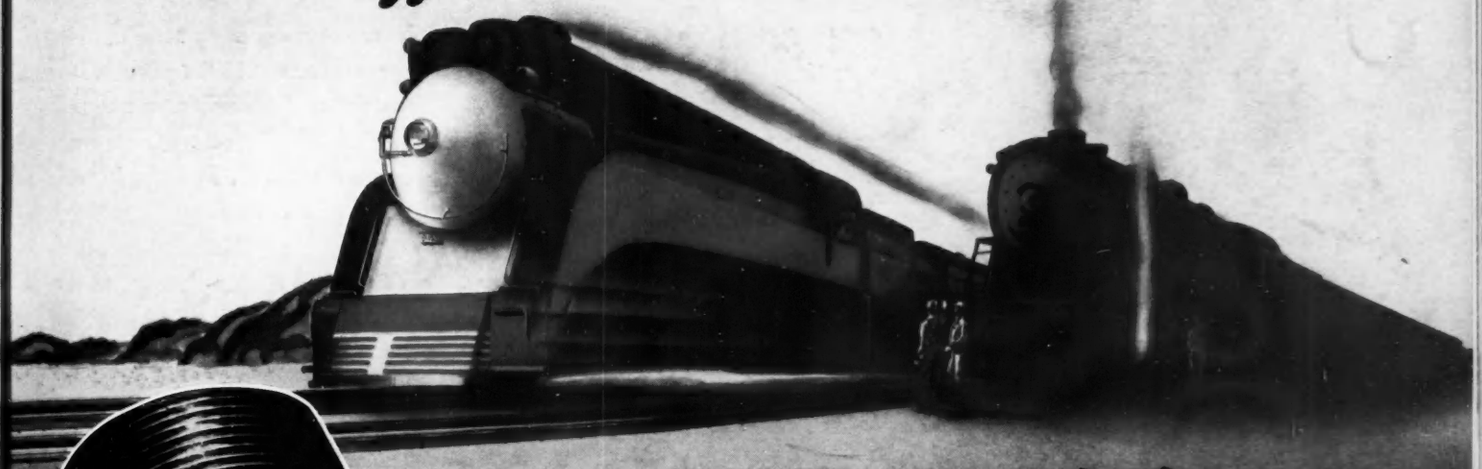
The Watson-Stillman Co.	—
*Waukesha Motor Co.	—
Webster Engineering Co.	—
*Well Machinery & Supply Co.	—
*Westinghouse Electric & Manufacturing Co.	—
*The Wheland Co.	—
*Wickwire Spencer Steel Co.	—
*J. H. Williams & Co.	—
*Wilson Manufacturing Co.	—
*Wilson Supply Co.	—
Witte Engine Works	—
*Worthington Pump & Machinery Corp.	—
Wyatt Metal & Boiler Works	—

Y	
Youngstown Sheet & Tube Co.	—

OCT 10 1939

You don't make time

"off the main line"—



—and you don't make hole

with your bit "OFF BOTTOM"

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Drill a FAST, STRAIGHT FULL GAUGE HOLE and Save Expensive Round Trips

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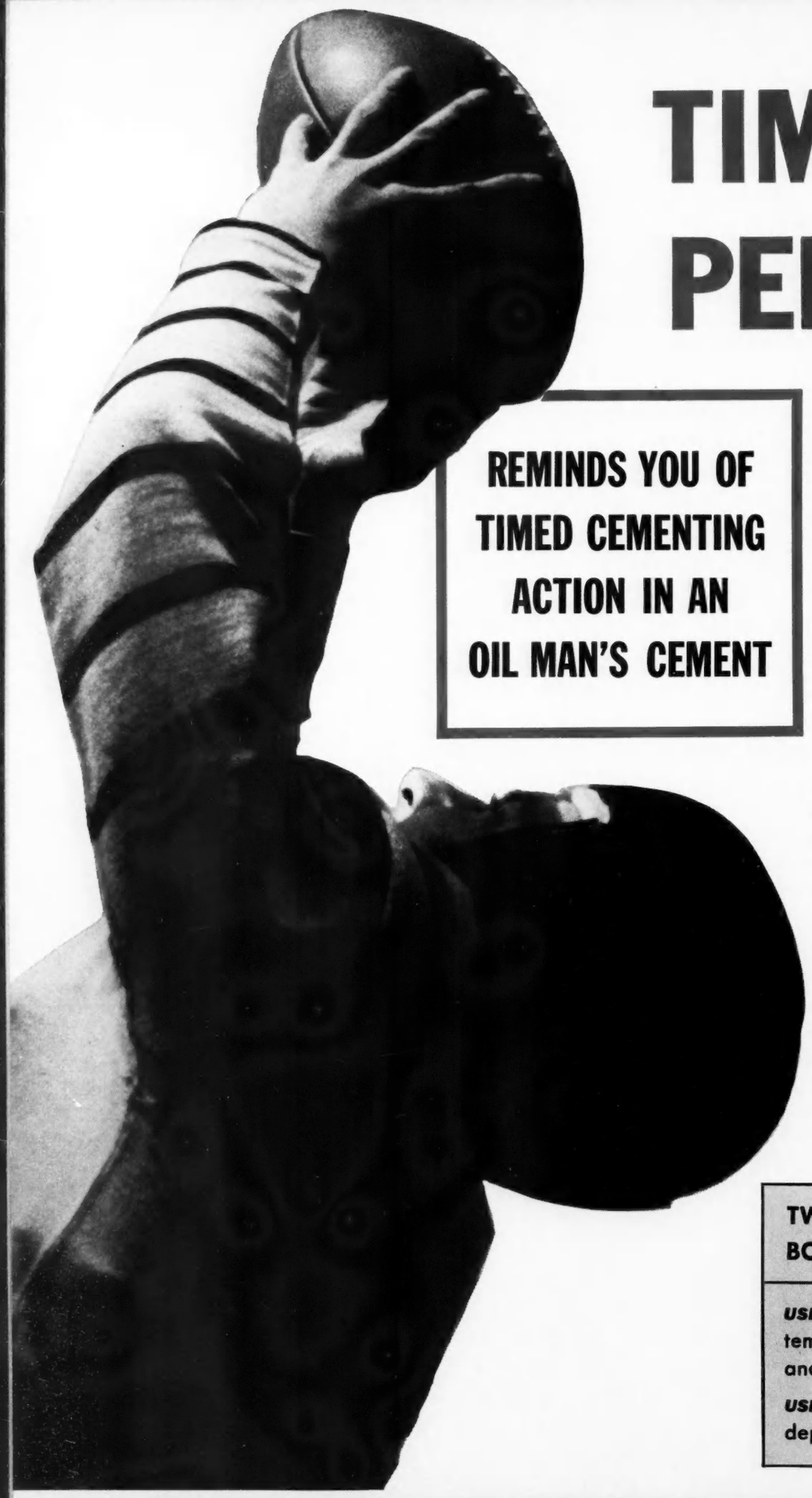
HOUSTON, TEXAS, U. S. A.



TIMING'S PERFECT

REMINDS YOU OF TIMED CEMENTING ACTION IN AN OIL MAN'S CEMENT

WELL-EXECUTED forward pass... prettiest play in football. Calls for perfect timing. Reminds you, in a way, of a well-planned reconditioning job. For that takes perfect timing, too. Timed cementing action, in an Oil Man's cement —'Starcor.'

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For wells of moderate depth and low temperatures, use 'Incor'*. For construction work above-ground, Lone Star. Portland cements, all—backed by Lone Star's record for all-around dependability for over a quarter century. *Reg. U. S. Pat. Off.

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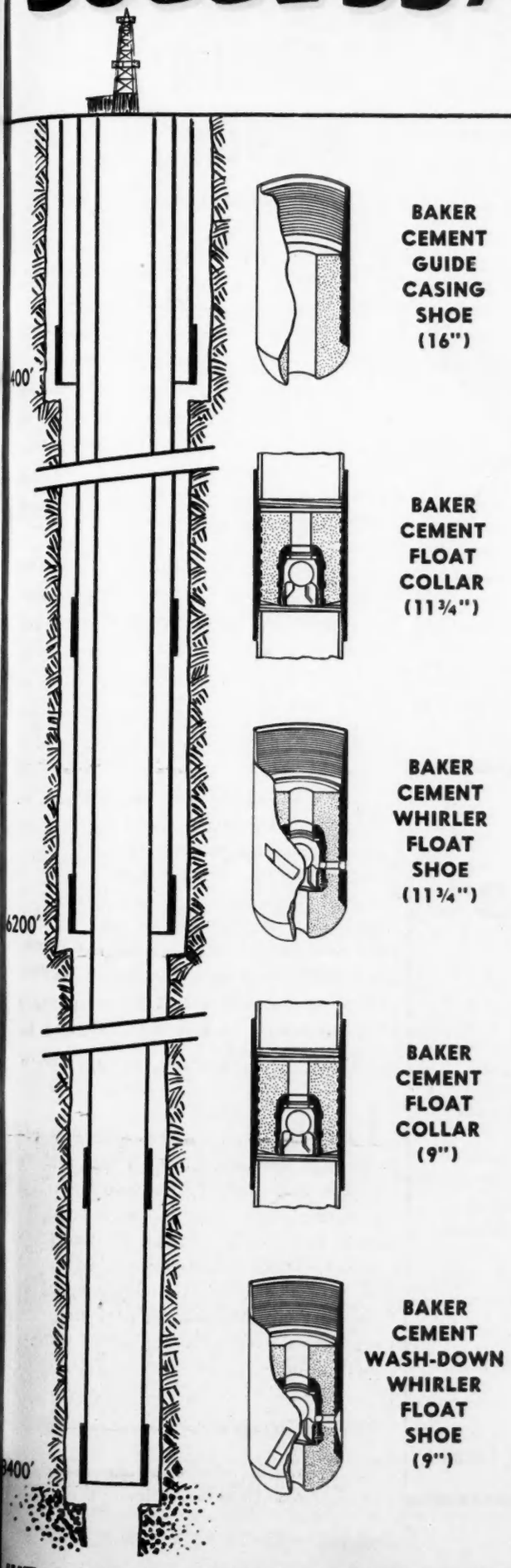
USE 'STARCOR'—for deep wells, high temperatures, extra sulphate resistance.

USE 'INCOR'—for wells of moderate depth, and low temperatures.

LONE STAR CEMENT CORPORATION

MAKERS OF LONE STAR CEMENT • 'INCOR' 24-HOUR CEMENT • 'STAR[illegible]' CEME[illegible]

SUCCESSFUL RESULTS



BAKER CEMENT GUIDE CASING SHOE (16")

BAKER CEMENT FLOAT COLLAR (11¾")

BAKER CEMENT WHIRLER FLOAT SHOE (11¾")

BAKER CEMENT FLOAT COLLAR (9")

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are

INEXPENSIVE

WHEN YOU USE

BAKER CEMENT GUIDING, FLOATING, CEMENTING EQUIPMENT

Figure It Out For Yourself!

Illustrated at left is the casing program of a well drilled recently in the North Belridge, Calif., field. The total cost of this well was approximately $100,500 —the entire investment being directly dependent upon the safety and efficiency with which the casing was landed and cemented.

The cost of the necessary Baker Cement Guiding, Floating, Cementing Equipment to safely and efficiently do this job amounted to not 10% or even 5%, but approximately

FOUR TENTHS OF ONE PERCENT
of the total well cost.

That's why we say that *Successful Results are Inexpensive* when you use BAKER CEMENT GUIDING, FLOATING, CEMENTING EQUIPMENT . . . as in all cases, the cost of the Baker equipment needed represents only a fractional part of the total well investment . . . yet the safety and efficiency with which this equipment does its job often determines the future of the well.

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Complete details concerning the exhaustive line of Baker Cement equipment for landing and cementing casing will be found on pages 231 to 242 of the Baker Section of your Composite Catalog.

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ELBOWS and TEES

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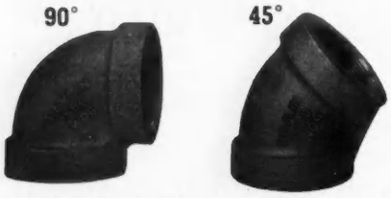

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LOOKING AHEAD

WITH THE EDITOR

Recycling Plant at Bammel.

THE problems created by the absence of a market outlet for natural gas and the penalties invoked by the Texas Railroad Commission for gas wastage have been solved satisfactorily in the Bammel field of Brazoria County by an independent operator. The solution was the construction of a very simple, but efficient recycling plant, in which the distillate is extracted from the gas and the remaining dry gas is returned to the producing formation. The return of the dry gas to the reservoir sand meets provisions of the Texas conservation rules, and the market will absorb all distillate recovered. Moreover, the return of the residue gas to the formation will prevent dissipating the reservoir pressure. Thus, several birds are being killed with one stone, not the least of which is the creation of a marketable product that yields some revenue. The simple recycling plant in use at Bammel is the subject of an article to be published next week.

LITTLE things often spell efficiency in pumping. Through feel, the experienced pumper often spots and prescribes for trouble promptly, much in the fashion of the old family doctor. There are numerous "tricks of the trade" employed by pumpers, and these are the subject of Pumping Series Article No. 23, ready for publication.

The OIL WEEKLY, Published every Monday. Entered as second-class mail matter December 23, 1916, at the post office at Houston, Texas, under act of March 3, 1879.